BEFORE THE WASHINGTON UTILITIES AND TRANSPORTATION COMMISSION

Docket No. PG-160924
Puget Sound Energy
Greenwood Complaint

PUBLIC COUNSEL DATA REQUEST NO. 028

PUBLIC COUNSEL DATA REQUEST NO. 028:

Refer to Puget Sound Energy response to Public Counsel DR No. 013 and related attachments.

a. With regard to Attachment A, please confirm that the inspection process contained therein was in effect during the period in September 2004 when the cut & cap procedure at 8409 and 8411 Greenwood Ave N. was to occur. If not confirming please explain and provide a copy of the inspection process in effect in September 2004.
   i. Page 4 of Attachment A provides an Overview of the Inspection Process. The Overview states that the inspection information is recorded on a site Audit form. Please explain who performs this inspection (PSE or contractor employee and title) and provide a copy of this form for the cut & cap at 8409, 8411 and 8413/8415 Greenwood Ave N. performed in September 2004. If the completed Site Audit form is not available, please explain why not.
   ii. Who is the Service Provider?
   iii. Please provide any documentation that shows PSE or Pilchuck inspectors were trained on the inspection process and procedures prior to performing the inspection work at the service line locations noted above.
   iv. Provide a copy of the monthly reports of the results of the Site Audit forms for the year 2004 tracking compliance by contractor Pilchuck.
   v. Refer to page 62 and 113 of the inspection procedure. Provide a copy of the inspection check list showing that the inspector had performed the verification steps listed on these pages.
b. Explain whether or not PSE currently relies on its contractors to perform all on-site quality inspections for installation and abandonment (cut & cap) of mains and services.
c. If PSE employees perform all on-site inspections, please state when this practice began.
d. If PSE employees do not perform on-site inspections, please explain why not and how PSE ensures main and service lines installation and

abandonment are being done in compliance with its procedures and specifications.

e. If PSE employees perform all on-site inspections, please state when this practice began.
f. If PSE employees do not perform on-site inspections, please explain why not and how PSE ensures main and service lines installation and abandonment are being done in compliance with its procedures and specifications.

Response:

Puget Sound Energy ("PSE") responds as follows:

a. With regard to Attachment A, please confirm that the inspection process contained therein was in effect during the period in September 2004 when the cut & cap procedure at 8409 and 8411 Greenwood Ave N. was to occur. If not confirming please explain and provide a copy of the inspection process in effect in September 2004.

The overall inspection process contained in Attachment A to PSE's Response to Public Counsel Data Request No. 013 was in effect during the period in September 2004 when the cut and cap procedure at 8409 and 8411 Greenwood Avenue North occurred. Details pertaining to specific inspection items may have been updated to reflect changes in PSE standards or procedures implemented subsequent to the publishing of the version provided in Attachment A, but the process itself remains largely unchanged.

i. Page 4 of Attachment A provides an Overview of the Inspection Process. The Overview states that the inspection information is recorded on a site Audit form. Please explain who performs this inspection (PSE or contractor employee and title) and provide a copy of this form for the cut & cap at 8409, 8411 and 8413/8415 Greenwood Ave N. performed in September 2004. If the completed Site Audit form is not available, please explain why not.

PSE Quality Assurance Inspectors perform the inspections described in the Inspection Manual. Work at 8409, 8411 and 8413/8415 Greenwood Avenue North was not selected by a PSE Quality Assurance Inspector for inspection as part of the audit sample and therefore inspection forms do not exist.

ii. Who is the Service Provider?

The "Service Provider" is the contractor responsible for performing the work on PSE's gas infrastructure. In 2004, this included Pilchuck and Potelco.

iii. Please provide any documentation that shows PSE or Pilchuck inspectors were trained on the inspection process and procedures prior to performing the inspection work at the service line locations noted above.

Documentation showing that PSE or Pilchuck inspectors were trained is no longer available.

iv. Provide a copy of the monthly reports of the results of the Site Audit forms for the year 2004 tracking compliance by contractor Pilchuck.

Please see PSE's Response to Public Counsel Data Request No. 019.

v. Refer to page 62 and 113 of the inspection procedure. Provide a copy of the inspection check list showing that the inspector had performed the verification steps listed on these pages.

Please see PSE's response to (a)(i), above.

b. Did the Quality Assurance Plan in Attachment B supplement the process in Attachment A or supersede it? Also provide the dates when this process was in effect.

The Quality Assurance Plan in Attachment B is supplemental to the process described in the Gas Site Audit Inspection Manual. The information in the plan provides a holistic overview of quality assurance for both gas and electric construction and maintenance service providers whereas the Gas Site Audit Inspection Manual provides specific inspection guidance solely for PSE gas infrastructure construction. The first Quality Assurance Plan was developed in 2008 although the process described in the plan had been in effect for many years.

c. Did the Quality Assurance Plan in Attachment C supplement the process in Attachment A and B or supersede it? Also provide the dates when this process was in effect and confirm that it is currently in effect. If not confirming, please provide a copy of the inspection process currently in effect. Provide a copy of the Gas Site Audit Inspection Manual referenced on page 4 of Attachment C.

The Quality Assurance Plan in Attachment C is the 2013 version of the plan and supersedes Attachment B, the 2011 version of the plan. The updated plan included minor revisions of the organizational structure. The overall quality assurance process described in the 2013 Quality Assurance Plan is still in effect with some modifications as a result the implementation of PSE's Service Provider Alignment (SPA) project in July 2015. The inspection process described in the Gas Site Audit Inspection Manual has remained unchanged. A copy of the Gas Site Audit Inspection Manual in effect in 2013 and the most current version, last updated in 2015, are attached as Attachments A and B.

d. Explain whether or not PSE currently relies on its contractors to perform all on-site quality inspections for installation and abandonment (cut & cap) of mains and services.

PSE service providers are contractually obligated to have a written Quality Control Program ("QCP") and to comply with that program. The QCP for PSE's gas construction service provider requires 100% inspection by the job foreman (quality control). Additionally, PSE provides quality control work-in-progress inspections and post-construction quality assurance audits on a sample of the work performed by a PSE service provider.

e. If PSE employees perform all on-site inspections, please state when this practice began.

Please see PSE's response to (d), above. PSE Quality Assurance Inspectors inspect all gas high-pressure work whether performed as part of a service provider contract or by bid contract.

f. If PSE employees do not perform on-site inspections, please explain why not and how PSE ensures main and service lines installation and abandonment are being done in compliance with its procedures and specifications.

As stated above, PSE contractually requires the service provider to implement a QCP that provides controls to ensure the work they perform meets PSE requirements. PSE utilizes a quality assurance methodology that audits a sample of in-progress (crew on site) and post-construction work. The sample size of post-construction work utilizes the service provider's performance as a contributing factor in the sample size determination.

ATTACHMENT A to PSE's Response to PUBLIC COUNSEL Data Request No. 028.

PUGET SOUND ENERGY

QUALITY ASSURANCE & INSPECTION

QA&I INSPECTION MANUAL

Natural Gas Facility Installation
Low, Intermediate, and High Pressure

March 2013

PUGET SOUND ENERGY

QA&I INSPECTION FOR LOW AND INTERMEDIATE PRESSURE

Table of Contents

Gas QA&I Process Overview

Site Audits are random inspections performed on jobs selected from the daily crew assignment sheets by the Service Providers performing gas construction work. Many jobs are available for inspection only during the window of time between pipe installation and backfill. The Site Audit represents a “snapshot” inspection of work components performed on a job rather than an inspection of an entire job.

The primary purpose of this Site Audit Inspector’s Manual is as a job aid for those conducting site audit inspections and to promote consistency among the Inspectors. It contains a list of different inspection items related to gas installation tasks. This manual describes how inspection points are to be calculated for each item inspected. It also breaks down each inspection item into a list of primary inspection checks.

The inspection checks listed in this manual typically have three points in common.

1. Are required by PSE, which may be beyond State and Federal requirements.
2. Are written in PSE Operating Standards, Gas Field Procedures or a supplemental manual.
3. Have inspection criteria that are objective rather than subjective and in which the individual conducting the inspection can observe or in some way verify the work was performed satisfactorily.

Since each inspection check contains a reference, it can also be used as a guide to applicable standards and procedures. Some items are more involved than can be covered in this manual, so in these instances the user should review the Operating Standards or Procedures Manual for the requirements and more detailed information.

When conducting a site audit inspection the results are entered into the QA&I inspection database. Each inspection item checked is marked as either satisfactory or unsatisfactory. Upon completing an inspection the results are discussed with the crew foreman. Normally any problems identified during the inspection should be corrected at that time.

When a problem is identified and no crew is on site, prompt notification is necessary because some corrections can become increasingly difficult to make as time goes by and the dirt work progresses.
In those instances the contractor is promptly contacted by phone and sent an email with the Site Audit Report information.

Likewise, after a problem is corrected, prompt notification is necessary to allow the inspector the opportunity to verify the correction before the site is bulldozed, landscaped, etc.
When initially contacted by a QA inspector the contractor should give an estimate of when the correction can be made. In some instances a QA inspector may need to be on site during the correction.

Once a problem has been corrected the contractor should promptly contact the inspector. Also they must return a copy of the Site Audit Report (or send a reply email referencing the site audit) that gives the following details about each correction made:

1. The date of the correction.
2. The name of the person who made the correction (legible).
3. A detailed description of how the problem was corrected (legible).

The correction status of a deviation remains "Uncorrected" until the information is received/verified.

Inspection results are then compiled into a monthly report to track the contractor's performance.

Inspection Guidelines

- At the beginning of each "Crew on Site" audit, locate the person in charge of the job so they are aware an inspector is on site.

- Inform the person in charge in advance of plans to inspect items contained in or on crew vehicles. Do ***not*** enter any vehicle or open any vehicle doors even if permitted to do so by the person in charge. Preferably at a time when it is least disruptive to the work in progress, a crew person should bring out all of the items requested for inspection. Request permission to access roof pipe racks before performing pipe inspections.

- When the crew is on site, the person in charge should receive a copy of the Site Audit Report along with a complete explanation of the inspection results. The person has the option of declining this.

- Details about an inspection deviation should be written on the "Remarks" line for the item inspected. Remarks should include a description of the problem along with the proximity of the deviation and its severity. Clearance deviations should always include the measurements. Also note the Operating Standard or Procedure reference in the remarks.

- When practical, pictures of clearance problems should also include a tape measure in the picture for reference.

- There may be some deviations (such as a single large rock in the initial backfill) where it makes sense for the inspector to make the correction while on site. In situations like this the inspector should contact the crew’s supervisor to verify that there are not any objections to the inspector making the correction. Depending on the deviation, a before and after picture should be taken. The pictures should be included with the Site Audit Report.

- The Site Audit Report should still indicate an "Unsatisfactory" condition with "Action Required". The "Correction Date" must be entered along with a note in the "Remarks" section indicating that the inspector corrected the deviation.

- When performing QC Inspections and there is a deviation on an item that the QC Inspector recorded, remember to give a “Satisfactory” whether correction is complete or not and report your findings in the comment section.

Safety

The Inspector must be aware of events that might impact safety on the job, and of the working conditions under which to stop work, such as:

- Imminent danger
    - To the public, service provider, or PSE personnel
    - To PSE facilities or its systems
- Unsafe conditions
    - The Inspector must notify the Quality Control Manager or Superintendent and document the condition(s) and the outcome in the Site Audit Inspection Report. Ensure there is sufficient detail regarding the condition and then forward this report to the QA&I Supervisor. If an unsafe condition was rectified, the Inspector must also document the solution. If unsafe conditions continue, the Inspector shall notify PSE's *Manager QA&I* and *Manager Safety.*
    - Employees must report all unsafe conditions and practices to their supervisor, manager, or foreman.
    - Once reported, local management then takes appropriate corrective action.
    - Contact any member of the Safety Department for their recommendations for corrective action.
    - All employees have the right to stop work if an unsafe condition is present, so that the condition can be corrected.
- Life-threatening accident
    - The Inspector may stop work on the job site, dial 911 first, and then call dispatch. Also, contact the *Manager Safety.*
    - ***NOTE:*** Every PSE employee is responsible for their own safety.

QA&I conforms to the PSE Safety Department's PPE guidelines outlined in the "Yellow Book." (See also the Employee Safety and Health Program (Yellow Book).

Definitions

Satisfactory: Indicates that all of the Inspection Item's requirements (that were pertinent and available to audit) conformed to PSE Standards and Procedures. Since we often are only able to audit a small section or portion it does not mean QA&I is approving an inspection item or job.

Unsatisfactory: Indicates that one or more of the inspection item checks do not fully meet PSE requirements/specifications. A correction may or may not be required depending on the item.

Examples of "Unsatisfactory" with no "Correction Required" could be:

- Past due instrument calibration (only for instruments not being used)
- Gas Field Procedure manual not on site
- Materials such as pipe improperly handled (provided no damage occurred)
- Qualification Card not on site (provided person's qualifications are still valid)

Action Required: Indicates that an Unsatisfactory inspection item resulted in an unsatisfactory installation that needs to be fixed. NOTE: A variance granted by the Standards Department is also acceptable.

Action Required enables the database to track the problem until it is fixed.

Examples of "Unsatisfactory" with "Action Required" could be:

- Bad fuse on pipe at the edge of the trench intended for installation
- Buried pipe that has been damaged
- Holidays left in pipe coating

Database "Item Applicability" column *(this information only displays in the database)*: All 27 Inspection Items must be assigned one of these four options on every Site Audit.

Not Applicable: Means the inspection item does not apply to the job at any time during construction.

Example: "Welding" would be "N/A" on a new PE service in a PE joint trench plat.

Yes-Inspected: Means yes it is applicable and it was inspected. This is the required option when you have a number in either the Satisfactory or Unsatisfactory column.

Yes-Not Available: Means yes it is applicable but the Inspector is not able inspect it at the time.

Example: A 5/8" PE conversion service coming off a STW main. "Welding" would be "Not Available" if the weld punch-it tee was welded on the main and backfilled prior to the Inspector arriving on site. Another example could be doing a post-inspect of a 5/8" PE NCC Service. The "Initial Backfill" item would be "Not Available" (unless the Inspector decided to pot-hole the service).

Yes-Not Inspected: Means yes it is applicable and was also available, but the Inspector decided not to check it. When this option is selected there should be a note in the Remarks explaining why the item was skipped.

*Example:*The Inspector audits a crew twice on the same day. Since points for "Manuals on Site" can only be given once a day the Inspector would choose "Yes-Not Inspected" for the item and note in the Remarks column that the manuals were checked on a previous job that day.

Deviation Classifications *(this information only displays in the database)*

PSE Gas Quality Assurance & Inspection Directory

	Mail Stop	Cell Phone	Office Phone
Manager QA&I:			
Kaaren Daugherty	EST-07W	425-766-2409	425-462-3748
Supervisors:			
Jerry Halsen	EOB-01	425-471-5297	425-356-7547
Administrative Asst:			
Monica Ferguson	EST-07W	-- -- --	425-462-3087
Gas QA Inspectors:			
Jimmy Allen	SKP-SVC	425-429-0623	360-475-7014
Carl Baggenstos	EOB-01	425-471-5295	425-356-7502
Jeff Horton	TAC-01	253-548-5589	425-356-7547
Jerry Engel	EST-07W	425-6910658	425-456-2858
Kirk Goodrich	EOB-01	425-231-3941	425-356-7520
Greg Haugen	EOB-01	425-754-5715	425-356-7512
David Lockhart	TAC-OFC	253-405-4879	253-476-6097
Steve Mellinger	FAC-SVC	206-255-4824	425-449-7543
Keith Miller	PUY-SVC	425-471-5301	253-845-6204
Kirk Schroeder	EOB-01	425-736-7041	425-356-7560

InfraSource Directory

Robert Veitch	VP Construction Operations	(253) 606-4299
Lenny Woods	Director Gas Operations	(425) 516-4747
Dave Wharton	Manager Quality Control	(206) 380-3451
Joel Werdall	Safety Director	(360) 507-1597
Tom Miller	Superintendent	(253) 606-2239
Gunner Anderson	Superintendent	(206) 375-3574
Jon Henderson	Superintendent	(360) 490-7167
Mike Beuslinch	Area Manager	(253) 606-4644
Dean Roberts	Superintendent	(425) 864-9698
Gary Barnes	ISF QC Inspector	(425) 736-2771
Kevin Kohler	ISF QC Inspector	(206) 940-8984
Jim Murray	General Foreman	(253) 720-1597
John Frederick	Superintendent	(425) 516-4928 Redmond
Mike Blood	General Foreman	(425) 864-6154 Redmond
Mark Bowling	General Foreman	(425) 864-9504 Snohomish
Jody Vorpahl	General Foreman	(253) 320-1828 Kent Fleet
Don Smith	Superintendent	(360) 490-7598 Lakewood

Site Audit Email List for InfraSource Crews

All reports with no deviations go to Kari Bates.

Reports with deviations go to area superintendent, Kari Bates, Kaaren Daugherty, Rick Elkin, John Dickson, Cheryl McGrath, Pam Parrish, Shamish Patel, Bob Stafford and Dave Wharton.

Olympia
Tom Miller

Seattle
Gunner Anderson

Pierce
Don Smith

Snohomish County
Dean Robert

Redmond
John Frederick

South King & Kittitas
Jon Henderson

Pipeline All Counties
Mitch Bogrand

Mitch Bogrand	(253) 606-6608
Todd Wiggins	(253) 606-5399
Cricket Shires	(253) 606-4301

Service Provider Locations

InfraSource:

Kent
8001 S 212th St
Kent, WA 98032

Lakewood
11705 83rd Ave SW
Lakewood, WA 98498

NOB
13330 Stone Ave N
Seattle, WA 98133

Olympia
2711 Pacific Ave SE
Olympia, WA 98501

Puyallup
5807 Milwaukee Ave E
Puyallup, WA 98372

Redmond
18150 Redmond Way
Redmond, WA 98052

Snohomish
1103 92 St SE
Snohomish WA, 98290

Sumner Office
14103 8th St E
Sumner, WA 98390

QA&I INSPECTION FOR LOW AND INTERMEDIATE PRESSURE

Inspection Item: Qualification Card

Pertains to:

Weld, Fusion, Mechanical Joints, Hot Tap Data Card. This pertains to all individuals who have qualification cards whether they are performing qualified work or not.

Calculation of points:

Individuals on the job site performing tasks requiring a Qualification Data Card can be checked. One point maximum for each person. The Inspector should not count points for the same person more than once in a single day.

Inspection Checks:

- Plastic joiners must carry Qualification Data Cards when joining PE pipe on PSE facilities (OS 2700.1600 sec 3.2). This pertains to personnel joining polyethylene pipe, tubing, and fittings by mechanical fittings and heat fusion methods (OS 2700.1600 sec 1).
- Welders must carry a Qualification Data Card when welding on PSE facilities (OS 2700.1100 sec 3.2).
- All company and contractor personnel performing hot taps shall have in their possession a valid Qualification Data Card or show proof that they are operator qualified to perform this work (OS 2700.1000 sec 5.2. CTS 1426 Tapping Steel and Plastic Pipe).
- If during a 12 month period, a plastic joiner has performed at least one production joint for each applicable joining procedure under a joining classification, the requalification test interval for that joining classification may be at a frequency of at least once annually, not to exceed 15 months (OS 2700.1600 sec 6.1.2.1).
- Notes and Best Practices: See Operating Standard 2425.1075 section 5 for definitions of compliance time frames.
- Some workers keep their cards in their vehicles. Request the card from the worker, preferably when it is least disruptive to the work in progress.
- If worker fails to have their card on site it should be counted as unsatisfactory but not requiring correction provided the person's qualifications are current. Verify with Tony Smith (206-571-1132) that the records show the worker's qualifications are current. When practical try to perform another Site Audit in the next few days to verify the person now has their Qualification Card on site.
- If worker is or has performed qualified work but does not have a current Qualification Card contact QA&I Supervisor ASAP to determine appropriate course of action.

Inspection Item: Manuals on Site

Pertains to:

Having a current copy of the Gas Operating Standards and Gas Field Procedures available at the job site. Also applies to personnel not working under the direct supervision of the job foreman such as a laborer watching JT sanding.

Calculation of points:

One point maximum for having both manuals (Gas Operating Standards and Gas Field Procedures) on the job site. The Inspector should not count points for the same manuals more than once in a single day.

Inspection Checks:

- Operating Standards covering the work to be performed must be available at locations, including worksites, where activities described in are conducted (OS 2425.1075 sec 3.3).
- Field Procedures covering the work to be performed must be available at locations, including worksites, where activities described in are conducted (OS 2425.1075 sec 3.3).
- Interim Operating Standards and Field Procedures may be published at any time, as required (OS 2425.1000 sec 3.4 and sec 4.1.1.1).
- Perform periodic audits of field and office personnel to verify that manuals have been updated in accordance with (OS 2425.1000).
- The manual owner is responsible for keeping their book up to date with the current version of each standard or procedure. (OS 2425.1075 sec 3.4.1.)

Inspection Steps:

1. **Verify manuals are the latest versions and contain any updates.**
2. **Request manuals from person in charge preferably when it is least disruptive to the work in progress.**
3. **Check contractor's computer for GOS and GFP.**
4. **If worker fails to have current manuals on site it should be counted as unsatisfactory but not requiring correction.**
5. **When practical try to perform another Site Audit in the next few days to verify the person now has their manuals on site.**
6. **Notify Area Superintendent by phone if a deviation is found.**
7. **Document findings in QA&I database.**
8. **Email report to all on the QA&I deviation list.**

Inspection Item: Calibration Verification

Pertains to:

Verifying that instruments are receiving accuracy checks. This inspection pertains to any instrument that will be used at some time during the life of the job. See OS 2450.1600 for instruments not listed here.

Calculation of points:

One point maximum for all instruments requiring an accuracy check (that are applicable to the job). The Inspector should not count points for the same crew's instruments more than once in a single day.

Inspection Checks:

- ✔ Accuracy checks and calibration of instruments shall be performed according to the schedules listed in the Operating Standards. All instruments shall be checked by trained personnel, in accordance with published manufacturers' procedures (OS 2450.1600 sec 3.5 & 3.7).
- ✔ Prior to first use, each new instrument shall have an accuracy check performed upon it (OS 2450.1600 sec 3.9).
- ✔ Instruments used in Company operations are sensitive and shall be handled with care. All instruments should be protected from moisture, temperature changes, and jarring where possible. When not in use, instruments shall be stored in a clean, dry place (OS 2450.1600 sec 3.10.1 & 3.10.2).
- ✔ All recorded calibration dates, including due dates on accuracy check stickers, shall be written using an mm/dd/yy format (OS 2450.1600 sec 3.11).
- ✔ MSA 60 (Combustible Gas Indicator) accuracy checked at least monthly not exceeding 45 days between checks (OS 2450.1600 table 5-1).
- ✔ Each Instrument tagged with a sticker that designates the next accuracy check due date (OS 2450.1600 sec 5.4.1).
- ✔ Pocket Pot or Digital Multi Meter accuracy checked at least once per year not exceeding 15 months between checks (OS 2450.1600 table 7-1).
- ✔ Pocket Pot Digital Multi Meter tagged with a sticker that designates the next accuracy check due date (OS 2450.1600 sec 7.3.1).
- ✔ Digital Thermometer (Pyrometer) accuracy checked twice per year not exceeding 7 ½ months between checks (OS 2450.1600 table 9-1).
- ✔ Digital Thermometer (Pyrometer) tagged with a sticker that designates the next accuracy check due date (OS 2450.1600 sec 9.3.1).
- ✔ 0-160 Analog Pressure Gauge (spring gauge) accuracy checked at least 4 times a year not exceeding 4 months between checks (OS 2450.1600 table 8-1).
- ✔ 0-160 Analog Pressure Gauge (spring gauge) (that do not have serial numbers), have ID numbers engraved on the back of the gauge as specified in the Standards (OS 2450.1600 sec 8.8, table 8-3).
- ✔ 0-160 Analog Pressure Gauge (spring gauge) tagged with a sticker that designates the next accuracy check due date (OS 2450.1600 sec 8.6).
- ✔ Portable Pressure Recorder (chart recorder) accuracy checked twice per year not exceeding 7-1/2 months between checks (OS 2450.1600 table 8-1).
- ✔ Portable Pressure Recorder (chart recorder) tagged with a sticker that designates the next accuracy check due date (OS 2450.1600 table 8.1).

Inspection Steps:

1. **Inspect calibrated instruments that will be used for the job that is being inspected when it is convenient for the crew.**
2. **Have the crew member get the instruments for you; don't go into their truck to look for instruments.**
3. **Check all dates and write them down so they can be entered in QA&I database.**
4. **Verify Spring Gauges have clear lens protecting needle and that the gauge reads "0" when not on pressure.**
5. **Recommend crews move outdated gauges being returned for recheck away from stored stock of approved gauges.**

continued

Inspection Steps, *continued*:

6. **Instruments without an accuracy check sticker, or a sticker that has non-legible re-check dates or dates past the allowable re-check due date should be counted as unsatisfactory for each piece of equipment.**
7. **No correction is required provided past due equipment is not being used. If crew is or has performed work with unchecked instruments contact QA&I Manager.**
8. **Notify Area Superintendent by phone if a deviation is found.**
9. **Document findings in QA&I database.**
10. **Email report to all on the QA&I deviation list.**

Inspection Item: Materials Handling, Storage and Transportation

Pertains to:

Pertains to how pipe and meters are transported in crew trucks and handled in the field.

Calculation of points:

One point maximum for handling, storage, or transportation of all pipe and meters.

Inspection Checks:

- Verify diaphragm meters are kept upright (OS 2550.2000 sec 9.1.1).
- Verify stored meters have inlet and outlet capped (OS 2550.2000 sec 9.1.2).
- Do not set a diaphragm meter that has been turned upside down (OS 2550.2000 sec 9.1.3).
- Do not set a meter that has been dropped (OS 2550.2000 sec 9.1.4).
- Do not set a meter that has been damaged (OS 2550.2000 sec 9.1.5).
- Meters turned in “as found” in the field (OS 2550.2000 sec 9.1.5.1).
- Reported on the Meter Remove Tag when damage occurred to a meter (OS 2550.2000 sec 9.1.5.2).
- Used meters handled with care (OS 2550.2000 sec 9.1.6).
- PE pipe exposure shall not exceed two years from the date of manufacture, regardless of the method of storage, even if stored inside (OS 2450.1500 sec 3.3).
- Straight and coiled stored PE pipe shall be stacked as described in GOS (2450.1500 sec 4).
- Verify proper handling of PE pipe (OS 2450.1500 sec 5)
- PE pipe not dragged across hard surfaces (such as concrete or asphalt) or crushed rock (OS 2450.1500 sec 5.2.1.1).
- Plastic end caps, tape, or other covering shall be installed and maintained on all PE pipe prior to fusion (OS 2450.1500 sec 3.2).
- All PE pipe shall be stored to keep the pipe joints straight, parallel, and without a downward center bow (OS 2450.1500 sec 4.1).
- No PE pipe (straight or coiled) shall ever be stored directly on the ground (OS 2450.1500 sec 4.1.2).
- When it is necessary to place PE pipe in a lane of traffic momentarily, the pipe shall be attended at all times, a flagger should be present, and vehicles shall not be allowed to drive directly over the pipe (OS 2450.1500 sec 5.2.5).
- PE or coated steel pipe laid along a ditch shall be supported off the ground protecting the pipe surface, unless there is no possibility of damage and approval is obtained from a PSE representative (OS 2450.1500 sec 4.3.1, OS 2450.1400 sec 4.3.1).
- Storage of steel pipe shall be stacked as described in (OS 2450.1400 sec 4 table 4-1 & 4-2)
- All steel pipe shall be stored at least 6 inches above the ground (OS 2450.1400 sec 3.2.1).
- Storage of steel pipe shall be stacked as described in (OS 2450.1400 sec 4 table 4-1 & 4-2)
- All steel pipe shall be stored at least 6 inches above the ground (OS 2450.1400 sec 3.3).
- Steel pipe shall be handled (lifting, moving, unloading) as described in (OS 2450.1400 sec 5).

Inspection Steps:

1. **Request permission to inspect the meters and pipe stored inside and on a vehicle from person in charge.**
2. **If the deviation is found on the truck (not yet installed) it should be counted as unsatisfactory but not marked correction required.**

continued

Inspection Steps, *continued*:

3. **If the deviation is installed it should be counted as unsatisfactory with correction required.**
4. **When possible in either instance the crew should correct the problem at the time of audit.**
5. **Coated and wrapped steel pipe should not exceed two years of exposed yard storage.**
6. **Coated or wrapped pipe (being stored) should be covered with a tarp to protect from UV exposure.**

Inspection Item: Service Prerequisites and Route Requirements

Pertains to:

After a service is installed, this item evaluates the route. It does not matter who provided the trench. The installation crew is responsible to ensure the service route is consistent with PSE standards and that all prerequisites have been met. This item also pertains to twin services and JT service stubs. Above ground portion of service at MSA is checked under the Meter Set Assembly inspection item.

Calculation of points:

One point maximum for each service route / requirement. Stub markers points are calculated using the 100' rule. One point for all stubs along 100 lineal feet of trench with each additional 100' section inspected counting as an additional point. Note: If the meter is in an acceptable location but there is an unapproved back yard service mark the point under this inspection item. If the meter is also in the back yard mark the point under the Meter Set Assembly inspection item (one point total).

Inspection Checks:

- When providing service to new construction single-family residential construction, before the service and meter are installed: final grade must be established and the fuel line must be in place and stubbed out with approved permit (OS 2550.2000 sec 3.1).
- Prebuilt anode less risers shall be installed such that the “bury line” is visible at or above final grade. (OS 2550.2000 sec 7.3.7)
- Joint trench service stubs provided for every lot (OS 2525.1500 sec 5.2).
- Joint trench service stubs marked with a Gas Stub marker which is properly supported by approved PVC pipe (OS 2525.1500 sec 5.2.3).
- Joint trench service stubs have the Lycofit fitting taped horizontally to the PVC stub marker support white and gray only (OS 2525.1500 sec 5.2.4 and Figure 5-2).
- Services shall not be installed over oil tanks, septic tanks, in septic drain fields or reserve areas, or under trees with deep roots waiver for deep roots W08-23R (OS 2550.1500 sec 4.1.1).
- Services shall not be located in conflict with or under building footings, pier supports, carports, sheds, areaways, covered terraces and other construction features either existing or proposed. Services shall not be installed below the level of a footing if closer than 12 in. to the wall (OS 2550.1500 sec 4.1.2. OS 2525.1700 sec 6.5.1).
- Services shall not be installed across cul-de-sacs (OS 2550.1500 sec 4.1.3).
- Service shall only be installed when there is main adjacent to the property in the right-of-way or adjacent to the utility easement for the property (2550.1500 sec 4.1.4).
- Services shall be provided from the street from which the building is addressed, except when main is in alley, building is on corner lot or approved by Contract Mgmt (OS 2550.1500 sec 4.1.7).
- Service shall not be installed through back yard except when main is in alley or approved by Contract Mgmt (OS 2550.1500 sec 4.1.8).
- Twin service length not more than 100’ unless approved by Contractor Mgmt (OS 2550.1500 sec 6.3).
- Twin service has main in front of the MSA location of both homes (OS 2500.1500 sec 6.6).
- Service shall not installed in place of main such as running a service parallel to the R/W beyond an existing main end on jobs where a main extension would be required (OS 2550.1500 sec 3.3).
- Service shall not be installed to a building until the building is framed (OS 2550.2000 sec 3.2).
- Mains and services shall not be installed under concrete slabs adjoining a manufactured/mobile home or RV foundation unless approved by Manager of Standards (OS 2525.3100 sec 4.2).
- For new commercial and industrial services, the service shall be a minimum 1 ¼” except as approved by Contract Management (OS 2550.1500 sec 8.2).
- Service sized as specified in Standards (OS 2550.1500 tables 11-1 thru 11-9).

continued

Inspection Checks, *continued*:

- 1 1/8" PE service connected to steel mains with correct tee size as specified (OS 2550.1600 table 10-2). See tables 10-1 thru 10-7 for remaining service tee sizing requirements.
- Services shall be provided from the street from which the building is addressed, except when main is in alley, building is on corner lot or approved by Contract Mgmt (OS 2550.1500 sec 4.1.7).
- Service shall not be installed through back yard except when main is in alley or approved by Contract Mgmt (OS 2550.1500 sec 4.1.8).
- Twin service length not more than 100' unless approved by Contractor Mgmt (OS 2550.1500 sec 6.3).
- Twin service has main in front of the MSA location of both homes (OS 2500.1500 sec 6.6).
- Service shall not installed in place of main such as running a service parallel to the R/W beyond an existing main end on jobs where a main extension would be required (OS 2550.1500 sec 3.3).
- Service shall not be installed to a building until the building is framed (OS 2550.2000 sec 3.2).
- Mains and services shall not be installed under concrete slabs adjoining a manufactured/mobile home or RV foundation unless approved by Manager of Standards (OS 2525.3100 sec 4.2).
- For new commercial and industrial services, the service shall be a minimum 1 ¼" except as approved by Contract Management (OS 2550.1500 sec 8.2).
- Service sized as specified in Standards (OS 2550.1500 tables 11-1 thru 11-9).
- 1 1/8" PE service connected to steel mains with correct tee size as specified (OS 2550.1600 table 10-2). See tables 10-1 thru 10-7 for remaining service tee sizing requirements.

Inspection Steps:

1. **Upon arrival, figure out how the service was installed by looking for asphalt patches, bore holes in the grass or other signs of disruption to property.**
2. **Confirm service route is not under property features such as sheds, carports, and oil tanks.**
3. **If digging up a service to check for depth of initial backfill, dig carefully so pipe is not damaged. Separate final fill from initial fill so sand may be re used or use new sand that you carry on your truck.**
4. **Measure the level of initial backfill as well as the total depth of service line.**
5. **Backfill with initial fill and final fill, compact and clean up area that was disturbed.**
6. **If crew is on site during inspection, confirm proper pipe size, EFV, wire installation, and tie in location and service route.**
7. **Document findings in QA&I database.**
8. **Note any deviations, if deviations are found, email report to all on the QA&I deviation list.**

Inspection Item: Meter Set Assembly

Pertains to:

MSA and the above ground portion of the riser. Also pertains to MSA locations and requirements including remote locations. Regulator and relief vent piping clearances from building features. Steel venting pipe installed from the regulator to a location that meets the clearance requirements for relief vents.

Calculation of points:

One point maximum for each MSA installation/requirements. Note: If the meter is in an acceptable location but there is an unapproved back yard service mark the point under Service Prerequisites and Route Requirements. If the meter is also in the back yard mark the point under the MSA inspection item (one point total).

Inspection Checks:

- ✔ Regulator vent clearances met (OS 2550.1800 sections 5-10).
- ✔ Service or riser replacements or altered MSAs brought up to Standards (OS 2575.2300 sec 3).
- ✔ Test and tied services meet requirements (OS 2525.2100 sec 4.4).
- ✔ For service to new construction single family residential customer the tie in to the customer's fuel line shall be done by PSE or PSE's Svc Provider unless approved by Contractor Mgmt (2550.2000 sec 8.2).
- ✔ When an AMR meter set is installed, the installer shall open and plug in the battery to energize the unit (GFP 4650.1400 step 2 pg. 3 of 4. OS 2550.2000 sec 7.3).
- ✔ When a 250 or 425 meter is removed disconnect AMR battery before leaving. (GFP 4650.1400)
- ✔ When a service is replaced a meter not in readily accessible or approved locations is moved to an approved location (OS 2575.2300 sec 10).
- ✔ Meter and regulator installed so as to minimize stresses upon the connecting piping and meter (OS 2550.1000 sec 3.5).
- ✔ Meter not in the back of the house unless residence is served from an alley or approved by Contractor Mgmt (OS 2550.1800 sec 3.13).
- ✔ Riser and meter valve shall have immediate access and operation of the grease fitting and operating head in an emergency (OS 2550.2000 sec 7.4.2, GFP 4575.1060 pg 2 step 5).
- ✔ MSA shut-off valve shall be installed a minimum of 8 inches above final grade and the meter shall be installed a minimum of 6 inches above final grade (OS 2550.2000 sec 7.4).
- ✔ The service riser shall be installed with a minimum of 6 inches (250 & 425 meters) and 8 inches (1000 meters) clearance from the building wall and in no case shall any part of the MSA be closer than 2 inches from the finished building wall (OS 2550.2000 sec 7.1 and 7.2).
- ✔ MSA in snow country meet the specified requirements (OS 2550.2000 sec 7.5).
- ✔ All above ground portions of the service shall be steel (OS 2550.1500 sec 4.1.6).
- ✔ Propane customer fuel line stub out location shall comply with the meter location requirements of OS 2550.1800 (OS 2675.1000 sec 4.4.1).
- ✔ Services not placed into service upon completion shall be left off, locked, and tagged, as specified in the Standards (OS 2550.2000 sec 12 & OS 2575. 2200 sec 3).
- ✔ On service replacements the GFR and the Service Provider shall re plumb the customer's fuel line with a meter outlet valve (A-9 valve) for 250 meters or with a bypass bar for 425 or 1000 meters (OS 2550.2000 sec 12.4.1).
- ✔ PSE or PSE's service provider shall test the service regulator in accordance with GFP 4550.1020 (OS 2550.2000 sec 12.2.1).
- ✔ Service provider tested the service regulator on new construction and svc replacements (OS 2550.2000 sec 12).
- ✔ PSE tested the service regulator on conversion services (OS 2550.2000 sec 12.3.2).
- ✔ 425 and 1000 meters supported during installation (OS 2550.2000 sec 7.6).

continued

Inspection Checks, *continued*:

- Meter manifolds installed with 1" mobius fittings on pounds delivery only and or A-9 valve on inches WC or pounds delivery (OS 2550.2000 table 12-1).
- MSA (working) clearance zone obtained from PSE electric meter (OS 2550.1800 sec 6.1 and figure 6-1 and 6-2). Note this pertains to a working clearance not regulator vent clearance. If both the MSA clearance and regulator vent fail to meet standards document only once under "Regulator Relief Vent Clearance" inspection item.
- The MSA shall be installed plumb in order to minimize anticipated stress on the connected piping and the meter. (OS 2550.2000 sec 7.4.6)
- A union shall be installed just downstream of the relief vent if the vent piping will be greater than 3 feet (OS 2550.1800 sec 10.1.1)
- The MSA location shall comply with the requirements for clearances between the service regulator relief vent and building features as required in the Standards (OS 2550.1800 sec 5).
- The service regulator relief vent terminates at least 12 inches above final grade (OS 2550.1800 sec 5.6).
- The service regulator shall be installed with the relief vent pointed downward to prevent the accumulation of water, ice, or snow (OS 2550.1800 sec 5.5).
- Clearances for operable windows shall be determined by measuring from the closest window opening to the relief vent termination (OS 2550.1800 sec 5.7).
- Any window manufactured to open is considered open able regardless if it is temporarily painted or screwed shut. (OS 2550.1800 sec 5.7.1).
- Relief vent clearances met (OS 2550.1800 sec 5, table 5-1).
- If it is not possible to place the regulator relief vent in a location outside of the required clearance zone, then steel vent piping shall be installed so gas can be discharged into the atmosphere without undue hazard. Vent piping should be used as a last resort (OS 2550.1800 sec 5.3).
- Steel pipe is the only acceptable material to use for vent piping. (OS 2550.1800 sec 5.3).
- Never down size the piping from the vent opening. Street elbows are not to be used in vent piping (OS 2550.1800 sec 10.3).
- Install one size pipe for the entire run. If a pipe size is larger than the vent opening needed, expand up to that pipe size immediately outside the vent opening (OS 2550.1800 sec 11.3).
- Piping shall be anchored to prevent undue strains on connected equipment and shall not be supported by other piping (OS 2550.1800 sec 10.4 and 2525.2400 sec 4).
- Vent piping sized per standards (OS 2550.1800 sec 11. OS 2525.2400 sec 4).
- Relief and breather vents shall be designed to prevent entry of weather, insects, or other foreign materials. The vent lines shall not be tied together, but run separately and point downward (OS 2550.1900 sec 6.6).
- The vent piping shall be installed to prevent the accumulation of water, ice, or snow. For vent piping on service regulators, a full opening vent cap with an insect screen shall be installed and the screened opening shall point in a downward direction (OS 2550.1800 sec 10.5.1).
- The vent piping shall be installed to prevent the accumulation of water, ice, or snow. For vent piping on an external relief valve, a weather cap shall be installed (OS 2550.1800 sec 10.5.2).
- Service regulators located in vaults and inside buildings shall be vented to the outside atmosphere (OS 2550.1900 sec 6.1 and 6.6).
- Each regulator that might release gas in its operation is vented to outside atmosphere (OS 2550.1000 sec 3.3).
- Fuel line touching MSA piping or meter, Insulating devices shall be installed (OS 2600.1400 sec 4.1) Separation between MSA & fuel line shall be 1" or more. (OS 2550.200 sec 7.3
- Meter must be leveled for accurate reading (GD & CS 4060.1100 pg.1).

continued

Notes and Best Practices: Clearances do not apply to building features around outside corners on the structure when the service regulator relief vent is located at least 12 inches from the corner. When a regulator vent is less than 12 inches from the corner, building features on adjacent walls are then also applicable when taking measurements (OS 2550.1800 figure 9.1 thru 9.3).

Clearances do apply from features on inside corner adjacent walls. In these instances, measure line of sight from the relief vent to the building feature.

MSA (working) clearance zone obtained from PSE electric meter (OS 2550.1800 sec 6.1 and figure 6-1 and 6-2) are note checked under this inspection item but rather under inspection item "Meter Set Assembly". If both the regulator vent and MSA clearance fail to meet standards, document only once under this (Regulator Relief Vent Clearance) inspection item.

Inspection Steps:

1. **Check and measure regulator vent clearances.**
2. **Measure MSA clearances from building features.**
3. **Check that battery is plugged in to AMR meter.**
4. **EFV tag installed and placed correctly when applicable.**
5. **Meter is locked correctly.**
6. **Warning tag is correctly placed and job number is written on it, when applicable.**
7. **Fuel line is tied in when applicable, and has 1" of clearance from the MSA.**
8. **Wrench marks are sanded or filed smooth and paint looks good.**
9. **A-9 valve is installed.**
10. **MSA is installed plumb and level.**
11. **MSA supported when not tied in to fuel line.**
12. **If bricks were used as a means of "temporary support" and the fuel line is tied in, remove bricks and return to PSE stores**
13. **If crew is on site during inspection, watch fitter test regulator per GOS and GFP.**
14. **Document findings in QA&I database.**
15. **Note any deviations, if deviations are found, call area superintendent and email report to all on the QA&I deviation list.**

Inspection Item: Locate Wire

Pertains to:

Proper installation of locate (tracer) wire. Anode installations for locate wire are audited under this inspection item and not the CP Requirements inspection item.

Calculation of points:

Locate Wire points are calculated using the 100' rule. One point for all wire along 100 lineal feet of trench. Each additional 100' section inspected counts as an additional point.

Inspection Checks:

- Tracer wire installed at pipe depth and laying near the PE pipe (OS 2525.2300 sec 6.2).
- Tracer wire not spiral wrapped around the PE pipe (OS 2525.2300 sec 6.2.1).
- The tracer wire shall terminate above ground, and be securely attached to the neck of the riser (OS 2525.2300 sec 8.1).
- Tracer wire joined with approved splice kit (OS 2525.2300 sec 3.2, GFP 4575.1015).
- When a PE main is extended from a steel main, the tracer wire shall be brought to the surface in a wire box (OS 2525.2300 sec 5.2). Note: see CP Requirements for inspection of the test lead.
- To facilitate locating, a physical connection to the tracer wire shall be available approximately every 500 ft along the main either at a service riser or brought up in a wire box (OS 2525.2300 sec 9).
- In joint trench construction, the locating wire shall be run up with each service stub marker and taped to the conduit supporting the stub marker (OS 2525.1500 sec 5.2.2 and 5.2.3).
- Tracer wire shall be cathodically protected (with proper PSP read -0.5 V) as required (OS 2600.2000 sec 4.4.3.2).Or has a 1# anode installed.
- PE service extending from wrapped steel or bare steel mains, the tracer wire shall be spirally wrapped around the service tee. Do not wrap tracer wire around PE pipe. (OS 2525.2300 sec 8.3) A 1 pound anode shall be installed (OS 2600.2000 sec 4.4.2).
- For every 1000 feet of locate wire, a one pound anode shall be installed (OS 2600.2000 sec 4.4.1).
- Anode shall be placed at or below pipe or tracer wire depth, and at least 6 inches away from the pipe (OS 2600.2000 sec 3.1).
- Ground strap for attaching the locate wire is installed as specified in the procedures (GFP 4575.1000).
- When attaching locate wire to metallic pipe, Cad weld is made prior to inserting PE pipe into Cad welded pipe (OS 2525.2300 sec 4.3.2).
- Approved method used of attaching tracer wire to steel casing (OS 2525.2300 sec 4.3).
- Wire spirally wrapped (non conductive) only occurs as a last resort when casing is 4” or larger and has existing PE inserted (OS 2525.2300 sec 4.3.3). Note: can’t cad weld on inserted casing and ground straps are limited to 2” or less casing diameter.

Notes and Best Practices: Taping locate wire to PE pipe is permitted. Contact with pipe must be minimized but is not prohibited. (OS 2525.2300 sec 6.2.2

New or repaired tracer wire shall be verified to have a PSP of less than -0.5V. If the tracer wire has a read of less than -0.5V no anode is required (OS 2600.2000 sec 4.4.3.2).

Examples - -0.4V is unacceptable and an anode is required. -0.6V is acceptable and no anode would be required.

Inspection Steps:

1. **Confirm that tracer wire is present and connected to the riser and take a psp read.**
2. **If crew is on site, inspect proper wire connection and anode placement.**
3. **Check wire for spirally wrapping around the pipe.**
4. **Document findings in QA&I database.**
5. **Note any deviations, if deviations are found, call area superintendent and email report to all on the QA&I deviation list.**

Inspection Item: Painting/Coating Exposed Facility

Pertains to:

Coating requirements of all exposed metal surfaces on meter set assemblies and exposed facilities for the purpose of preventing atmospheric corrosion of gas carrying facilities. Inspection for new construction includes all pipe upstream of the outlet spud including the spud. New construction customer fuel line is not included in this inspection. Some fuel line painting maybe required on existing MSAs where corrosion is present. Painting guard post, valve box lids and CP test box lids are not audited under this inspection item. Facilities in vaults are considered exposed facility.

Calculation of points:

One point maximum for each meter set assembly inspected on a job. Multiple meters on a manifold would count as one assembly.

Inspection Checks:

- Cold applied tape shall be installed in accordance GFP (GFP 4510.1100).
- Wax tape applied in accordance with GFP 4510.1130
- Mastic applied in accordance with GFP 4510.1110.
- Meter set assemblies shall have paint applied to all exposed metal surfaces in accordance with GFP 4510.1140 (GOS 2600.1100.7.3)
- If atmospheric corrosion is present on existing MSA fuel line, "Customer Notification Tag - Meter Inspection Notice" is left for the customer (GFP 4510.1140 Figure 1).
- Painting temperature requirements followed (GFP 4510.1140).
- Painting steps when moisture is present followed (GFP 4510.1140 Step 3 pg 2 of 5).
- Painting dry time requirements followed (GFP 4510.1140).
- Painting air temperature requirements followed (GFP 4510.1140).

Notes and Best Practices: Be sure and verify complete paint coverage including pipe threads and any factory-applied paint that is cracked, chipped, or scarred during installation to ensure the holiday is cleaned and re-painted. A best practice is to paint all pipe installed when connecting the meter to the customer's fuel line.

Exposed pipe shall be completely dry before primer or paint is applied. Over spray on finished walls should be brought to the Service Providers attention. A common practice is to primer and paint some bare steel fittings in advance in dry conditions to use on wet days. Once installed the pre-painted fittings require only a minor touch-up. Commercial/industrial risers (with template bar) shall be painted to prevent rusting even though the crew is not setting the meter.

Factory applied mill coatings do not require painting unless chipped or cracked. Colors other than gray are acceptable.

Irregular fittings are those that do not have smooth contour and cannot be wrapped easily with cold applied tape, such as flanges and valves.

Inspection Steps:

1. **Inspect all painted areas of the meter set including the threaded areas of fittings.**
2. **Check any scaring wrench marks or cracked existing paint for proper repair.**
3. **Mud, dirt, and excess pipe dope should not be painted over.**
4. **If customer fuel line has corrosion, check if customer notification tag was left with customer.**
5. **Primer and paint should be applied to all areas directly worked on.**
6. **Document findings in QA&I database.**
7. **Note any deviations, if deviations are found, call area superintendent and email report to all on the QA&I deviation list.**

Inspection Item: Initial Backfill Material

Pertains to:

This pertains to select material under the pipe (a.k.a. bedding) and select material over the pipe (a.k.a. shading)

Calculation of points:

Initial Backfill points are calculated using the 100' rule. One point for all initial backfill along 100 lineal feet of trench. Each additional 100' section inspected counts as an additional point.

Inspection Checks:

- If the trench bottom contains any sharp or unusually rough surfaces, a minimum of 4 in. of initial backfill is required to bed the pipe, unless the carrier pipe is encased or the pipe is wrapped in an approved rock shield material. (OS 2525.1800 sec 4.1).
- Initial backfill shall consist of sand, native soil, or soil-based material that does not contain sharp rocks or rocks larger than ½ in. diameter (OS 2525.1800 sec 4.2).
- Initial backfill shall provide firm support under and around the pipe and shall be used for at least the first 6 inches of cover over the pipe after compaction (OS 2525.1800 sec 4.2).
- Initial backfill shall be used for the first 12" of cover, after compaction if the final backfill contains rocks larger than 8" in diameter. (OS 2525.1800 sec 4.3.1)
- Do not unload or backfill or pile it directly on top of PE pipe until proper support is provided for the pipe (OS 2525.1800 sec 3.4).
- Rock shield in lieu of initial backfill is used with steel pipe and not PE pipe (OS 2525.1800 sec 4.4.1.2 and 4.1.3).
- In cases where approved CDF is used as backfill, initial backfill shall be installed under, around, and over the pipeline as necessary to provide a minimum of 6 inches of separation between the pipeline and the CDF. (OS 2525.1800 sec 8.1).
- Crew placed or observed the placement of the initial backfill (OS 2525.1600 sec 6.2).
- If crew chooses to use native material for bedding and padding the native material meets all the requirements of (OS 2525.1800. OS 2525.1600 sec 6.2).
- Backfill material shall not contain garbage, cans, glass, decomposable organic material, construction debris, washed gravels (including pea gravel), materials that will not compact, sharp objects, frozen clods, large rocks and stones, pieces of pavement, wood skids or wedges, timbers, hay bales, boulders, or other materials that may cause damage to the pipe, pipe coating, or casing/conduit (OS 2525.1800 sec 3.2).
- Sand meeting the requirements of PSE specification (1275.1380) shall be used for initial backfill. Exceptions allowed in OS 2525.1800 sec 4.2.1.1

Inspection Steps:

1. **Always carry sand on your truck to use after digging up a service.**
2. **Crew has backfilled with proper initial material.**
3. **If crew is backfilling with equipment, make sure caution is taken to not contaminate initial backfill material.**
4. **If on site with crew, confirm that pipe is supported prior to sand being dumped on top of it.**
5. **Confirm that the initial fill has no sharp objects or rocks larger than ½" in diameter.**
6. **4" of initial fill under pipe if trench bottom has any rough or sharp surfaces. 6" initial fill over the top of the pipe.**
7. **Initial fill must comply with PSE requirements.**
8. **Document findings in QA&I database.**
9. **Note any deviations, if deviations are found, call area superintendent and email report to all on the QA&I deviation list.**

Inspection Item: Final Backfill Material

Pertains to:

This pertains to material other than initial backfill used to fill in the excavation.

Calculation of points:

Final Backfill points are calculated using the 100' rule. One point for all final backfill along 100 lineal feet of trench. Each additional 100' section inspected counts as an additional point.

Inspection Checks:

- Final back fill shall be sufficient to with stand normal wear and tear from foot traffic, weather, and other activities that may cause erosion (OS 2525.1800 sec 5.3).
- Final backfill shall not contain rocks larger than 10 inches in diameter, except as allowed in 5.2.1 (OS 2525.1800 sec 5.2).
- Steel pipe 8” and larger in diameter may have rocks up to the lesser of 12” in diameter or 100 pounds. (OS 2525.1800 sec 5.2.1)
- Backfill material shall not contain garbage, cans, glass, decomposable organic material, construction debris, washed gravels (including pea gravel), materials that will not compact, sharp objects, frozen clods, large rocks and stones, pieces of pavement, wood skids or wedges, timbers, hay bales, boulders, or other materials that may cause damage to the pipe, pipe coating, or casing/conduit (OS 2525.1800 sec 3.2).
- Where municipality requirements for CDF conflict with PSE specification (1275.1475) the municipality requirements should be followed.

Notes and Best Practices: In cases where approved CDF is used as backfill, initial backfill material shall be installed under, around, and over the pipeline as necessary to provide a minimum of separation between the pipeline and the CDF. (OS 2525.1800 sec 8.1) Refer to the inspection item for Initial Backfill for this inspection check.

Inspection Steps:

1. **Confirm that final fill does not contain any garbage or construction debris.**
2. **When excavating, check backfill material to assure it meets OS requirement.**
3. **Dig with caution not to damage pipe or other facilities.**
4. **When excavation has exposed gas piping, measure for depth of service and layers of backfill material (initial & final).**
5. **Backfill and compact as required.**
6. **Grade and clean area.**
7. **Check backfill material to assure it meets GOS requirements.**
8. **Document findings in QA&I database.**
9. **Note any deviations, if deviations are found, call area superintendent and email report to all on the QA&I deviation list.**

Inspection Item: Cover and Pipe Depth

Pertains to:

The minimum cover required in PSE standards, which shall be in place over natural gas main or service. And the minimum installation depth requirements permitted by municipalities. Reinforced concrete cap in lieu of pipe depth is also inspected under this item.

Calculation of points:

Cover points are calculated using the 100' rule. One point for all cover along 100 lineal feet of trench. Each additional 100' section inspected counts as an additional point.

Inspection Checks:

- Transmission lines, mains and services shall not be gassed up until there is the minimum depth of cover is met in accordance with (OS 2525.1700) with acceptable backfill in accordance with (OS 2525.1800 and 2525.1600 sec 6.4)
- PE pipe inserted in conduit must still be provided with the minimum cover before being gassed up (OS 2525.1800 sec 3.3).
- Service lines in right of way shall be buried with a minimum cover of 18 in. (OS 2525.1700 sec 7.5.1).
- Service lines on private property should have 18” cover, and shall be buried with a minimum 12” of cover from final grade (OS 2525.1700 sec 7.5.1.1).
- Intermediate pressure (IP) and low pressure (LP) mains should normally be buried with 30” of cover and shall be buried with a minimum of 24” of cover (OS 2525.1700 sec 7.4.2).
- For service lines under drainage/bar ditches, 24” of cover is required. Cover shall be measured from the lowest point of the ditch (OS 2525.1700 sec 7.5.3).
- For gas mains under drainage/bar ditches, 36” of cover is required. Cover shall be measured from the lowest point of the ditch (OS 2525.1700 sec 7.4.6).
- Pipe in Right of Way is installed to meet minimum depth requirement of permitting municipality (OS 2525.1700 sec 7.1).
- The minimum cover over any buried gas facility shall not be less than 12 in. without the specific approval of the Manager Standards even if a protective cap could be installed (OS 2525.1700 sec 7.3).
- If an underground structure or formation prevents a small portion of the main or service from being installed with the minimum cover required a protective cap shall be installed (OS 2525.1700 sec 7.7.1).
- The cap shall be separated from the carrier pipe by a minimum of 6 in. of select, well compacted backfill material that meets the initial backfill requirements in OS 2525.1800 (OS 2525.1700 sec 7.7.2).
- Reinforced concrete cap (in lieu of pipe depth) is cast in place at least 4 inches thick, with a compressive strength of 3000 psi and colored with a red dye (OS 2525.1700 sec 7.7.3).
- All commercial and industrial services 1 ¼” or larger shall be buried with a minimum of 24” cover unless approved by the Manager Contract Management (OS 2525.1700 sec 7.5.2).
- The customer can dig to within 1 foot of the gas stub marker at the property line work pit. The customer shall not expose the gas pipe or the gas service stub (OS 2525.1600 sec 4.1.2).

Notes and Best Practices: Cover requirements indicate the minimum cover over buried gassed up pipelines. Cover refers to the distance between the surface of the backfill and the top of the pipe/conduit regardless if the trench is completely filled to final surface grade. Depth refers to the distance between final surface grade and the top of the pipe/conduit regardless if the trench is backfilled.

Inspection Steps:

1. **If on a post audit, uncover pipe with caution.**
2. **Measure depth of exposed pipe to confirm it meets GOS requirements.**
3. **Check anodeless risers to make sure bury line is above final grade**
4. **Document findings in QA&I database.**
5. **Note any deviations, if deviations are found, call area superintendent and email report to all on the QA&I deviation list.**

Inspection Item: Clearances - Underground

Pertains to:

This pertains to clearances from underground encroachments (non gas facility) such as other utilities (pipe, wires, guys, posts, poles), sewer, storm pipes, underground vaults, septic tanks, buildings (footings, foundations), steam lines, obstacles (piles, dead man, very large boulders), etc.

Calculation of points:

Clearance points are calculated using the 100' rule. One point for all clearances along 100 lineal feet of trench. Each additional 100' section inspected counts as an additional point.

Inspection Checks:

- Mains shall be separated at least 12” from the building and structure footings or foundations when the pipe runs parallel to the building. If 12” separation cannot be maintained the pipe shall be shallower than the bottom of the footing or foundation (OS 2525.1700 sec 6.5.1).
- Services should be separated at least 12” from the building and structure when the pipe runs parallel to the building. Where 12” of separation cannot be maintained, the pipe shall be shallower than the footing or foundation (OS 2525.1700 sec 6.5.1).
- IP & LP mains and services installed to meet required clearances (OS 2525.1700 sec 6.6).
- IP & LP services installed to meet required clearances (OS 2525.1700 sec 6.7).
- In no case shall gas facilities be less than 12 inches from power (OS 2525.1700 sec 6.6.2.1, 6.7.1.1, 6.7.2.2).
- In no case shall gas facilities be in direct contact with non-gas structures. This does not apply when the pipeline is encased in accordance with sec 6.7 and the other non power utility is also in casing or conduit (OS 2525.1700 sec 6.7.3).
- For new JT construction, other utilities shall not be placed above gas piping (with the exception of crossing utilities) anywhere in the clearance zone (OS 2525.1700 sec 6.8 figure 6-1).
- Polyethylene gas mains and services (either direct bury or in casing) shall not be closer than 50 ft from any active steam lines under any circumstances (OS 2525 .1700 sec 6.13).
- No metal objects or unapproved devices used to maintain separation from other utilities in JT excavations (OS 2525.1200 sec 6.7.2).
- Pipelines crossing under stream crossing culverts shall maintain 12” clearance from the bottom of the culvert (OS 2525.1700 sec 6.4).
- Expose all utilities in the plowing or hole hogging path to verify location and depth (OS 2525.1200 sec 9.6)
- Clearance between PE pipe and bond cable 3” minimum under pipe (GFP 4510.1030)

Notes and Best Practices: “Facilities Crossing” is defined as two facilities that cross at or greater than a 45 degree angle. Any angle less than 45 degree shall be viewed as parallel facilities (OS 2525.1700 sec 6.1).

All references to power in the clearance Standards include ground rods and ground wires (OS 2525.1700 sec 6.14).

Pertaining to “clearance zone” (OS 2525.1700 sec 6.8) the installation crews have no control over what is installed above gas facilities after their work is completed, but they should notify PSE anytime there is an indication that someone is planning to “stack” another facility over the gas pipe in conjunction with a JT installation.

Inspection Steps:

1. **During post audit, expose 12” around gas piping to measure for clearances from other facilities**
2. **When gas line is exposed, measure distance between gas and other facilities**
3. **Inspect bore/direction drill area to make sure all other facilities have been exposed and measured for depth prior to start of hole hogging or drilling.**
4. **Document findings in QA&I database.**
5. **Note any deviations, if deviations are found, call area superintendent and email report to all on the QA&I deviation list.**

Inspection Item: Inserted Pipe

Pertains to:

Inspecting inserted mains or services in PVC conduit and inserting pipe (PE or Steel) in existing facilities.

Calculation of points:

One inspection point for the first 100' of inserted pipe inspected. For larger jobs count an additional point for each additional 100' segment inspected. One point for each service inspected. Does not include clearance sleeves.

Inspection Checks:

- Service conduit provided by the customer is schedule 40 PVC (white or yellow) with no reference to any other utility type such as water or sewer (OS 2525.2000 sec 4.2).
- All conduit buried for the purpose of future gas line insertion shall meet the requirements of PSE Specification 1025.6335,except as provided in (OS 2525.2000 sec 4.2)
- The leading end of the pipe being inserted shall be capped (OS 2525.2000 sec 8.2 & 2525.1900 sec 4.11 & 2525.2100 sec 7.6).
- When main is installed in a casing or conduit both ends are sealed (OS 2525.1900 sec 4.1).
- A service line installed in conduit must be sealed at the casing end nearest the building wall (OS 2525.1900 sec 4.2).
- Sealant shall completely surround the carrier pipe in a manner that prevents the carrier pipe from touching the conduit (OS 2525.2000 sec 8.6.1)
- For sealing gas lines inserted into large-diameter casings, order 20 cu-ft kit using MID 9995991.
- When a service is installed in conduit, the end of the conduit at the property line or street (that is not sealed) shall have a mucket, or some other equivalent means, installed to prevent the carrier pipe from touching the end of the conduit (OS 2525.1900 sec 4.2.1).
- Aqua Seal not used on gas pipe greater than 1-1/8" or casing greater than 2" (GFP 4575.1050 pg 4).
- Aqua Seal is wrapped at least twice around the carrier/casing transition (GFP 4575.1050 pg 4 step 2).
- Aqua Seal is completely covered (over wrapped at least twice) with 1½" PVC tape (FP 4575.1050 pg 4 step 2).
- Conduit diameter is at least the minimum size specified in the Standards (OS 2525.2000 table 5.1).
- Conduit for main road crossings in plats shall be a minimum of 4" in diameter (OS 2525.2000 sec 5.2).
- Conduit for service road crossings in plats shall be a minimum of 2" in diameter (OS 2525.2000 sec 5.3).
- If a mechanical fitting is placed inside the conduit, it shall be noted on the as-built records (OS 2525.2000 sec 8.4).
- PE casing pipe sized per Standards (OS 2525.1900 Table 3-1).
- Casing pipe free of sharp or unusually rough surfaces (OS 2525.2100 sec 7.4).
- Plastic insert protectors (muckets) shall be installed between casing pipe ends and PE pipe to protect the inserted PE pipe from damage at the casing opening (OS 2525.2100 sec 7.5).
- If the carrier pipe is steel install a casing insulator or plastic doughnut at the end of the pipe to protect the exposed end of the pipe wrap. (OS 2525.1900 sec 4.11)
- Whenever PE pipe is encased suitable precautions shall be taken to prevent crushing or shearing of the plastic pipe where it exits the casing (OS 2525.1900 sec 4.6).
- Each facility abandoned in place or each line not subject to gas pressure shall be disconnected from all sources and supplies of gas, sealed at both ends with. (OS 2525.3600 sec 3.1).

Notes and Best Practices: OS 2525.2000, Conduit-Inserted Polyethylene Pipelines, does not apply to casing pipe that is installed by horizontal directional drilling (OS 2525.2000 sec 3.8).

continued

Inspection Steps:

1. **Confirm that gas piping and locate wire is centered in casing.**
2. **Main inserted in casing is sealed at both ends.**
3. **Service line in casing is sealed at the end nearest the building.**
4. **Proper sized casing is being used.**
5. **Conduit meets PSE requirements.**
6. **Muckets are being used.**
7. **Document findings in QA&I database.**
8. **Note any deviations, if deviations are found, call area superintendent and email report to all on the QA&I deviation list.**

Inspection Item: Leak Testing

Pertains to:

All new temporarily abandoned, relocated or replaced pipelines shall be tested before being placed in service. Also covers pre-tested repair pipe and soap test of MSA.

Calculation of points:

One inspection point for each test required on the job.

Inspection Checks:

- Maximum test pressure on PE pipe shall be 120 psig (OS 2525.3300 sec 4.1.2).
- Service lines are tested with test pressure maintained for a minimum of 15 minutes, at a minimum of 90 psig but no higher than 120 psig (OS 2525.3300 sec 8.8).
- Pipelines (excluding services) test pressure shall be maintained for the minimum duration as specified in the Standards (OS 2525.3300 table 5-1).
- With the exceptions of pipeline repairs, tie-ins, and certain fabricated units and short sections of pipe, all leak and strength tests shall be performed on pipe after it has been installed, and covered at a minimum with initial back fill per OS 2525.1800 (OS 2525.3300 sec 3.1.1).
- Service tested from point of break or disconnect to MSA valve (OS 2525.3300 sec 8.13.2)
- On damaged service, performed bar-hole survey over portion of service that remained active and was not pressure tested (OS 2525.3300 sec 8.13.3).
- All non-rated fittings, control lines, RTU and pen gauge connections, and other appurtenances shall be leak and strength tested in accordance with the type of facility on which they are to be installed (OS 2525.3300 sec 9).
- When a pipeline is installed and tested in segments, results of each test shall be recorded (OS 2525.3300 sec 10.1.1).
- A pressure recording gauge shall be used on all test segments of 1000’ or more in length. (OS 2525.3300 sec 5.5).
- Pressure recording gauge pen/chart indicates the time of day that the test actually began (OS 2525.3300 sec 5.5.1).
- The time for the test duration should be for test results only, not for the total length of time the segment is left pressurized after the test‘s completion (OS 2525.3300 sec 10.1.2).
- The test downstream of the regulator must include all company piping up to the tie-in to the customer‘s fuel line (OS 2525.3300 sec 8.11, GFP 4625.1000).
- Services have all exposed fittings and pipe connections tested with soap suds during the test period (OS 2525.3300 sec 8.6).
- When reinstating a service that has been physically disconnected from the main, the line must be tested in the same manner as a new service line (OS 2525.3300 sec 8.13.2).
- When inserting a segment consisting of multiple pipe lengths joined above ground, the entire segment shall be leak tested both before and after insertion. (OS 2525.2100 sec 7.10.2).
- Air testing IP mains in Kittitas County utilizing an air compressor, an after cooler with downstream water separator shall be used. (OS 2525.3300 sec 3.8 & GFP 4625.1030.
- Rated fittings that meet or exceed MAOP need only be tested at operating pressure with soap suds when placed into service (OS 2525.3300 sec 5.7).

Notes and Best Practices: All pipe shall be leak tested. Pipe used for repairs shall be tested before installation if it can’t be tested with the pipe downstream of the break.(OS 2525.3300 sec 3.1.2 and 3.1.3)

PE caps, except for Lycofit caps do not carry a manufacturers rating and must be tested with facility being built. Threaded and steel caps must be tested with the facility being built. (June 2000 Word Document).

continued

Inspection Steps:

1. **Confirm crew tested piping as required per GOS and test instruments are approved.**
2. **Exposed fittings soaped during air test.**
3. **Range of air test was between 90-120 psi.**
4. **At service riser, check for riser valve in open position and nipple to be used upstream of regulator is part of air test.**
5. **Once MSA is set, soap test from reg. to fuel line tie-in.**
6. **Soap test MSA to check for possible leaks per GFP 4625.1000. After soap test is complete, rinse residue with clean water.**
7. **If any leaks are found, call area superintendent to let them know of the deviation and to have a crew sent over to fix the leak.**
8. **If the contractor cannot get to the site in a timely manner, call dispatch and have GFR person show up to make the repairs.**
9. **Document findings in QA&I database, leaks are considered to be NHAGR, if found on above ground piping.**

Inspection Item: Purging

Pertains to:

Purging mains and services.

Calculation of points:

One point maximum for each purge on the job.

Inspection Checks:

- Purge procedure performed by individual currently qualified under PSE's OQ Program or person who is continually and directly observed by a qualified person (GFP 4700.1500 pg 1).
- All pipelines shall be purged of air before packing with gas (OS 2525.3400 sec 8.1).
- Public officials and residents in the vicinity notified if it is anticipated that they may be affected by noise, odor, traffic disturbances, or possibility of accidental ignition (OS 2525.3400 sec 9.2.1).
- Any section of main longer than 5 feet purged (OS 2525.3400 sec 8.2).
- Before any purging operation is initiated, purge connections shall be available in order to achieve and maintain the desired rate of flow within the pipeline (OS 2525.3400 sec 4.1).
- Plastic pipe shall not be used for purge vent piping (OS 2525.3400 sec 5.1.1).
- Service lines shall be purged through a grounded service riser equipped with a MSA valve (OS 2525.3400 sec 5.3.2.2 and GFP 4700.1500 pg 2 step 1).
- Service lines shall not be purged through the service regulator.
- Vent piping shall be orientated to direct the purged gas away from workers, the public, and all property (OS 2525.3400 sec 5.5).
- Vent piping shall be vertical metal of sufficient height with an approved control valve of the same size (OS 2525.3400 sec 5.1).
- Vent stack is secured in place (2575.2000 sec 3.2.1).
- Minimum purge flow rates attained per the Standards (OS 2525.3400 table 6-2 and GFP 4700.1500).
- Inert separators are used when required (OS 2525.3400 sec 6 and GFP 4700.1500 pg 4).
- The specified amount of nitrogen is used as an inert separator (GFP 4700.1500 pg 5, Table 2 & OS 2525.3400 table 6-3).
- Purge shall begin within 3 minutes of injecting the inert separator (GFP 4700.1500 pg 5 step 5).
- A CGI shall be used to verify a 0% gas environment. OS 2525.3400 sec. 10.1.2.1
- A CGI shall be used to verify a 100% gas environment. OS 2525.3400 sec. 9.4.2
- Each facility abandoned in place or each line not subject to gas pressure shall be disconnected from all sources and supplies of gas, purged in accordance with OS 2525.3400 (OS 2525.3600 sec 3.1).
- When purging a main, a service riser on a service cannot be used as a purge vent if the service has an EFV (2525.3400 sec 5.3.2.1).
- To prevent development of a static electrical charge on PE pipe, the pipe purge end shall be grounded as specified in the Standards (OS 2525.3400 fig 5-3 and 5-4).
- Whenever gas is being vented into open air, efforts shall be made to identify and remove each source of ignition from the area refer to sections (OS 2575.2000 sec 3.2).
- No smoking or open flames in areas or structures where a combustible mixture of gas and air may exist (OS 2575.2000 sec 3.2.2).
- When a hazardous amount of gas is being vented into open air or could result in an uncontrolled release of gas such as welding fusing, squeezing or tapping on live gas at least one fire extinguisher shall be available at the work site (OS 2575.2000 sec 4.1.
- When there is a controlled release of gas a manned fire extinguisher is required any time the control valve is 2 in. or larger and is located within the danger area (OS 2575.2000 sec 4.3.4).
- When a pipeline is being purged, the purge gas shall be introduced into one end of the line in a moderately rapid and continuous flow to prevent formation of a potentially hazardous combustible mixture of gas and air (OS 2525.3400 sec 3.2).

Notes and Best Practices: Service lines shall not be purged through the svc regulator.

Inspection Steps:

1. **Fire extinguisher available per GOS.**
2. **Inspect purge riser/service is grounded and has control means.**
3. **CGI used for purge to 100% gas.**
4. **Document findings in QA&I database.**
5. **Note any deviations, if deviations are found, call area superintendent and email report to all on the QA&I deviation list.**

Inspection Item: Squeezing Pipe

Pertains to:

Hydraulic and manual squeezing (and release) of PE Pipe (GFP 4700.1300 & 4700.1310). Squeezing of Steel Pipe (GFP 4700.1210).

Calculation of points:

One point maximum for each squeeze stop-off observed.

Inspection Checks:

Squeezing of PE Pipe GFP 4700.1300 / GFP 4700.1310

- Before Squeeze: Hydraulic PE Squeezers GFP 4700.1300
- Verify approved and proper sized squeezer used, with the proper bottom bar
- Squeezer is checked for damage, oil level, and dry run performed with Hydraulic(pg 3)
- Selecting Squeeze point (GFP 4700.1300 or GFP 4700.1310)
- Inspection of pipe per GOS 25751800 for gouges, damage, or defects
- Select location for gauge to monitor pressure.
- Select a PE squeeze point that is a minimum of three pipe diameters or 12 inches, whichever is greater, from fittings, fusion point, or previous squeeze points. PE not squeezed in the same location twice.
- Squeezing the PE Pipe (GFP 4700.1300–pg 5 or GFP 4700.1310-pg 7)
- Do not bend / hinge PE pipe at squeeze point (GFP 4700.1300 pg 1 and GFP 4700.1310 pg 1).
- Squeezers centered on pipe and set at 90 degrees to the pipe (GFP 4700.1300, Fig.2 & 3
- Do not place the PE squeezer over burlap as this could result in damage to the pipe.(GFP 4700.1300 pg. 5 step 2)
- Hydraulic – slowly squeeze pipe by pumping cylinder to the pressure of 3750 psi, then allow 1 minute per diameter of pipe size for cold flow (*allow double relax time if temperature is below freezing), then repeat (steps 4,5,&6)
- Mechanical – squeeze pipe at a rate of 1 minute per diameter inch of pipe – 2" pipe= 2 minutes.(GFP 4700.1310 pg. 7 step 4)
- Install saddle clamps when required. (GFP 4700.1300 pg. 5 step 7)
- Releasing the squeezer (GFP 4700.1300 pg 6 or GFP 4700.1310 pg 10
- Remove saddle clamps. (4700.1300 pg. 6 step 1)
- Release the squeeze slowly, at a rate of 2 minutes per diameter inch of pipe (4" PE =8 Min)
- Remove squeezers-check pipe for damage and perform soap test of squeeze area
- Wrap entire are with red tape
- Cold Squeezing of Steel Pipe GFP 4700.1210 & GFP 4700.1220
- No permanent steel squeeze on pipe greater than 3" in diameter (GFP 4700.1210 pg 1 & 4 and GOS 2525.1100 sec 8.4).
- Examine pipe in accordance to GFP 4515.1755 – examining steel pipe, EPCR.
- Remove wrap from pipe. If Coal Tar wrap see GFP 0150.3250
- Examine pipe for defects, girth weld, and longitudinal seams. Do ***not*** squeeze on girth welds or defects
- Select squeeze point directly over longitudinal seam, while maintaining 90 degree angle between squeezer and pipe.
- Squeezing of steel pipe (GFP 4700.1210 pg 4 & GFP 4700.1220)
- Squeeze pipe until the gas flow stops or minimum jaw distance has been reached. See table 1 for jaw distance.
- If double squeeze, reset squeezer 12" upstream of 1st squeeze (GFP 4700.1220 pg 2, step 2)
- When retiring a steel service, a 6 inch long metal reinforcement (angle iron or 1" pipe strap) is welded across the squeeze (GFP 4700.1220 pg 2 step 4, GOS 2575.1700 sec 10.5).
- A manned fire extinguisher shall be present when welding
- Install Bonding Cables across squeeze that will be cut (GFP 4700.1210 step 1).

continued

Notes and Best Practices: A double squeeze may be necessary to achieve a 100% shut off (GFP 4700.1300 pg 5 step 6). Re-rounding squeezed pipe by side squeezing is not allowed. PE squeezes performed with non-approved equipment cut out and replaced (GFP 4700.1300 pg 1 and GFP 4700.1310 pg 1). **Mechanical Squeezer #TR650 has different procedures – see GFP 4700.1310

Inspection Steps:

1. **Check squeezers for working condition.**
2. **Squeezers are set properly on pipe and meet clearances from other fittings or fusion/welds.**
3. **Check to make sure GFP is followed.**
4. **Once squeezers are removed, red tape applied to squeeze area on pe pipe.**
5. **Document findings in QA&I database.**
6. **Note any deviations, if deviations are found, call area superintendent and email report to all on the QA&I deviation list.**

Inspection Item: Exposed Facility Protected

Pertains to:

Above ground facilities that are installed or located in the proximity of vehicles which could potentially cause damage to the facility. This inspection item is also applicable when facilities are located in protective areas in lieu of guard posts.

Calculation of points:

One point maximum for each facility location. For example a 4-plex building with a 2-mtr manifold on each end properly protected would be 2 inspection points (one for each MSA).

Inspection Checks:

- In Snow country above ground facilities are protected as specified in the Standards (GOS 2525.3700 sec 3).
- In Flooding Areas – regulator vent requirements as specified (GOS 2525.3700 sec 4)
- Guard posts shall be installed to protect above ground facilities from vehicular damage that may be anticipated (OS 2525.3700 sec 6.1).
- MSA installed behind curbs – 10' space required for rolled curbs/ 7' space required for vertical face curb (GOS 2525.3700 sec 6.1.2)
- The meter shall not be installed until all the guard posts have been installed, except when guard posts would interfere with the meter installation such as large commercial and industrial MSA (GOS 2525.3700 sec 6.2).
- In no case shall the meter be turned on until required guard posts have been installed (GOS 2525.3700 sec 6.2.1).
- Guard posts should be painted caution yellow, especially for commercial/industrial locations, in street right of ways, and alleys (GOS 2525.3700 sec 6.4)
- Residential guard post requirements (GOS 2525.3700 sec; 6.5 / GOS 2550.1800 sec 3.10 & 3.10.1)
- If the MSA is subject to vehicular damage from more than one direction (i.e.- can be struck head on or at an angle due to a wide driveway or parking area) the following additional requirements apply (GOS 2525.3700 sec 6.5.2).
- Except as allowed in sec 6.5.2.1, a minimum of two guard posts shall be installed to protect a single-family residential MSA (GOS 2525.3700 sec 6.5.2).
- Commercial/Industrial or Multifamily guard post requirements (GOS 2525.3700 sec 6.6)
- When necessary to set guard posts, each post shall meet the requirements in GOS (2525.3700 sec 6.7) sketches showing details.
- When performing meter change outs personnel shall ensure the meter was not installed near a driveway, delivery doors or other high traffic areas where it may be subject to damage by a vehicle. If it is not possible to move the meter away from these areas, install guard posts (GOS 2550.1800 sec 3.10)

Notes and Best Practices: The MSA should not be installed near a driveway, delivery doors, or other high-traffic areas where it may be subject to damage from a vehicle. Look for nearby building damage or other indicators of vehicle damage that has already occurred. If it is not possible to install the meter away from these areas, install guard posts meeting the requirements of GOS 2550.1800. Even if guard posts can be installed for a meter set in a traffic area, the Manager Contract Management may, at his or her discretion, specify that the MSA be located elsewhere (OS 2550.1800 sec 3.10.1).

Inspection Steps:

1. **In snow country or flood zones, inspect exposed facilities to make sure they meet GOS requirements.**
2. **Check MSA if protection is required.**
3. **If protection is in place, make sure guard posts are set per GOS.**
4. **Check guard posts for paint and concrete cap.**
5. **Document findings in QA&I database.**
6. **Note any deviations, if deviations are found, call area superintendent and email report to all on the QA&I deviation list.**

Inspection Item: Restoration

Pertains to:
Job site clean-up, temporary asphalt patches, lawn & landscaping restoration.

Calculation of points:
Restoration points are calculated using the 100' rule. One point for all restoration along 100 lineal feet of trench. Each additional 100' section inspected counts as an additional point.

Inspection Checks:

- ✔ All areas where earth has been moved, equipment has operated, or material was stored, shall be restored as close to their original profile and condition as practical (OS 2525.1700 sec 8.1).
- ✔ Grading of unimproved right-of-way shall minimize interference with existing drainage. All grading shall be finished to restore the drainage or water flow conditions as close to original condition as practical and shall conform to regulations of governmental authorities having legal jurisdiction (OS 2525.1700 sec 8.1.1).
- ✔ All surplus excavated material, debris, or construction material shall be removed from the job and the site left in a clean and neat condition. All paved areas shall be washed or swept to remove spoil (OS 2525.1700 sec 8.1.2).
- ✔ Lawn areas shall be graded and sod replaced at original ground level. In areas where the turf has been destroyed, sufficient top soil shall be added to bring the area to its original grade and shall be re seeded with a good grade of lawn seed (OS 2525.1700 sec 8.1.3).
- ✔ The surface of all roads and streets shall be restored to a condition that is similar to the original surface. Drainage ditches, drain tile, and culverts that were impacted by the construction shall be restored or relocated to the satisfaction of the agency providing the permit (OS 2525.1700 sec 8.1.4).
- ✔ All damaged paving; sidewalks, curbs, and paved driveways shall be replaced to the satisfaction of the permitting agency and the Company Representative (OS 2525.1700 sec 8.1.5).
- ✔ The excavator, whether Company or contractor crew, shall be responsible for controlling or repairing settlement of back fill for a period of time, which varies for different jurisdictions in PSE service territory. (OS 2525.1700 sec 8.2).
- ✔ Deactivated CP boxes, valve boxes shall be filled or removed except as approved by MGR-Contract Management (OS 2525.2100 sec 9.4 and 9.5).
- ✔ Take care to protect the customer's property (shrubs, house et cetera) from over spray when using aerosol paint. Avoid painting on windy days (GFP 4510.1140 pg 2).

Notes and Best Practices: In wet conditions roads not adequately swept may produce sediment washing away from the construction site. In dry conditions or areas where sediment run off is not a problem, poorly swept roads would be captured under this Inspection Item along with the other restoration checks.

Backfill humps and speed bumps are considered Restoration problems.

If a temporary road patch is poorly installed so that it is found to be falling apart and cold mix is being thrown from the area by vehicles then the problem should be captured as a "Restoration" deviation. But if the cause of the temporary road patch failure is due to improper compaction of the backfill soil (e.g. ground under the temporary patch is sunken or spongy) then the deviation should be captured as "Compaction" and not "Restoration" because the primary cause of the problem can be attributed to a failure to have properly compacted final backfill.

Inspection Steps:

1. **Inspect area for construction debris.**
2. **Inspect Restoration, it shall be close to original conditions, sod, topsoil/seed, & area swept clean.**
3. **Inspect existing building for paint overspray.**
4. **If cold mix patch, check patch.**
5. **Document findings in QA&I database.**
6. **Note any deviations, if deviations are found, call area superintendent and email report to all on the QA&I deviation list.**

Inspection Item: Valve – Main, Service, Excess Flow

Pertains to:

Valve installation and requirements.

Calculation of points:

One point maximum for each valve installed or required.

Inspection Checks:

- Curb valves required on all new IP services 1-1/8 in. and larger, all new LP services 2 in. and larger unless the service is less than 30' long (with an outside MSA) or an Excess Flow Valve (with an outside MSA) is installed (OS 2525.2600 sec 8).
- If the stub and the extension are two different sizes, the size of the stub shall be used to determine whether a curb valve is required (OS 2525.2 600 sec 8.3).
- A three foot whip of 5/8 in. PE pipe may be substituted for a curb valve on existing 1-1/8 in. PE LP services that are being converted to IP (OS 2525.2600 sec 8.5.3).
- Service tees with internal valves may be used as curb valves if they are installed in a curb valve box (OS 2525.2600 sec 8.4).
- Curb valves shall be placed in accordance with (OS 2525.2600 sec 6.2.3.1)
- Curb valves shall be supported by means other than the service piping (OS 2525.2600 sec 8.8).
- Plastic curb valves shall be supported with prefabricated valve support boxes (1-1/8 in. through 4in.) (OS 2525.2600 sec 8.8.1).
- Non plastic curb valves shall be supported by bricks or sand bags (OS 2525.2600 sec 8.8.2).
- The top of the box should be flush with the existing grade (OS 2525.2 600 sec 3.4.3).
- If the service enters the building underground and a riser valve is not feasible to install, then a curb valve is required on the service line (OS 2550.1900 sec 4.1).
- An EFV shall be installed in lieu of a curb valve on 5/8" commercial services (2550.2200 sec 3.3).
- On new service installations or complete service replacements, the size of the service piping downstream of the EFV shall match the size of the EFV (i.e. no reducer shall be installed between the EFV and the meter set assembly. (OS 2550.2200 sec 3.1.1).
- EFV installed as specified in the Standards and Procedures (OS 2550.2200, OS 2550.1500 table 11-1, GFP 4575.1070).
- Verify spacing between main valves per standards (OS 2525.2600 sec 3.6 and sec 6).
- Main valves placed in specific locations per standards (OS 2525.2600 sec 6).
- Install a main valve when branching off to serve a plat, even if the branching main is the same size (OS 2525.2600 sec 6.2.5).
- Install a main valve anytime a PE branch saddle is installed. A valve shall be installed for branch saddles due to tapping tool limitations and PE squeeze requirements (OS 2525.2600 sec 6.2.4.1).
- Main valve installed in close proximity to both sides of bridges that support gas main (OS 2525.2600 sec 6.2.1).
- Main valve installed on both sides of rivers or other water crossings (OS 2525.2600 sec 6.2.2).
- On the branching main when branching a smaller size main from a 4" or larger main (OS 2525.2600 sec 6.2.3).
- Anytime there is a branch of any size 6 in or larger LP or IP main a valve shall be installed on the branching main (OS 2525.2600 sec 6.3.3).
- If a main valve is installed in a buried box or enclosure, the box or enclosure shall be installed so as to avoid transmitting external loads to the main (OS 2525.2600 sec 3.5).
- Dead end main valves do not require the installation of a valve box (OS 2525.2600 sec 3.4.3.1).
- Systems with different MAOPs or different operating pressures shall be maintained as two isolated systems by one of the methods specified in this standard (OS 2525.2600 sec 3.6.4).

continued

Notes and Best Practices: Valve requirements vary depending on the specific application. Please refer to the Standards for complete information Recommended curb valve locations: 1) at the property line, and 2) in the right-of-way between the curb and the sidewalk (OS 2525.2600 sec 8.6). Valves on private property away from vehicle traffic should be installed in a hex nut valve box. Valves in the R/W shall be installed in a street valve box. Top of valve box shall be flush with existing grade.

Inspection Steps:

1. **If crew on site, trip EFV.**
2. **Correct EFV is installed and in the proper location.**
3. **EFV tag at nipple below regulator.**
4. **Document findings in QA&I database.**
5. **Valve support used.**
6. **Note any deviations, if deviations are found, call area superintendent and email report to all on the QA&I deviation list.**

Inspection Item: Fusion

Pertains to:

Fusion of all PE mains and services.

Calculation of points:

One point maximum for each fuse inspected.

Inspection Checks:

- Joining of PE pipe shall be done by qualified personnel using approved procedures in accordance with Operating Standard 2700.1600 (OS 2525.1200 sec 3.9)
- Procedures followed when joining pipe by manual butt fusion (GFP 4600.1010)
- Procedures followed when joining pipe by hydraulic butt fusion (GFP 4600.1020)
- Procedures followed when joining pipe by side fusion (GFP 4600.1030)
- Procedures followed when joining pipe by electro fusion and sidewall/saddle electro fusion (GFP 4600.1040 & 1045)
- Install a protective sleeve over the service connection between PE pipe and the service tee. This applies to fusion connections less than 1-1/4" in diameter, and compression connections except for Lycofit couplings (OS 2550.2000 sec 5.4.1)
- When a hazardous amount of gas is being vented into open air, or the work process could result in an uncontrolled release of gas, such as welding, fusing, squeezing or tapping on live gas lines, at least one fire extinguisher shall be available at the work site prior to any individual entering or beginning work in the hot zone (OS 2575.2000 sec 4.1).
- If cuts, gouges, or scrapes deeper than 10% of the wall thickness are present, the damaged pipe shall be replaced (OS 2525.1200 sec 6.13.2)

Notes and Best Practices: Fusion environment should be protected from wind, rain, dust etc. and preventing drafts through open pipe ends. When fusing, PE pipe must be inspected to ensure there are no cuts, gouges, or scrapes deeper than 10% of the wall thickness (OS 2525.1200 sec 6.13). This requirement should be checked under the Inspection Item: Pipe – General Installation/Retirement Requirements.

Inspection Steps:

1. **Check over equipment to confirm that it is in proper working condition.**
2. **GFP is followed for fusion being made.**
3. **Fitter inspects fusion prior to your inspection.**
4. **Ask fitter if the fusion is complete and then inspect fusion for visual approval.**
5. **Fire extinguisher on site if fusing on live main.**
6. **Document findings in QA&I database.**
7. **Note any deviations, if deviations are found, call area superintendent and email report to all on the QA&I deviation list.**

Inspection Item: Welding

Pertains to:

Welding of all steel mains and services.

Calculation of points:

One point maximum for each weld inspected.

Inspection Checks:

- When a hazardous amount of gas is being vented into open air, or the work process could result in an uncontrolled release of gas, such as welding, fusing, squeezing, or tapping on live gas lines, at least one fire extinguisher shall be available at the work site prior to any individual entering or beginning work in the hot zone. Refer to (OS 2575.2000 sec 4) for policy on manned extinguishers.
- Only those welders with active cards shall be permitted to weld on Company piping (OS 2700.1100 sec 3.2.1).
- When installing a bare steel casing, a welder who is qualified through training and experience shall perform the weld (OS 2525.1900 sec 3.7).
- Common welding practices followed when welding steel pipe (GFP 4900.1000).
- Specific procedure followed for type of welding being performed (GFP 4900.1300-2100).
- Transition fittings welded to steel pipe kept continuously wet with a rag placed over the transition and PE portions of the fitting (GFP 4900.1120 step 1).
- Transition fitting has not had the steel portion shortened (GFP 4900.1120 step 3).
- When using mechanical line stoppers to isolate a section of pipe, welding work shall not be performed within 18 inches of a stopper (unless approved by Quality Assurance Inspector). (OS 2575.2000 sec 3.4.2).
- No welder may weld on the Company piping system with a particular welding process unless, within the preceding 6 calendar months, the welder has engaged in welding with that process (OS 2700.1100 sec 6.1).

Notes and Best Practices: During production welding, The Company's authorized representative may request immediate requalification of, or disqualify any welder that produces unacceptable welds or that may not have the necessary skills, even though qualification card is current (GFP 4900.1000 pg 1).

Inspection Steps:

1. **GFP is followed for weld being made.**
2. **Fitter inspects weld prior to your inspection.**
3. **Ask fitter if the weld is complete and then inspect weld for visual approval.**
4. **Fire extinguisher on site if welding on live main.**
5. **Document findings in QA&I database.**
6. **Note any deviations, if deviations are found, call area superintendent and email report to all on the QA&I deviation list.**

Inspection Item: Joining Pipe other than Weld or Fuse

Pertains to:

Joining pipe using means other than welding or fusion.

Calculation of points:

One point maximum for each mechanical fitting installed. Points apply only if the installation procedure was observed.

Inspection Checks:

- Procedures followed when joining pipe with flanged fittings (GFP 4610.1000).
- Follow the specified torque requirements for flanged fittings (GFP 4610.1000 pg 5-7).
- Follow the specified bolt tightening sequence for flanges (GFP 4610.1000 pg 5 fig. 1).
- Procedures followed when joining pipe with Dresser compression fittings (GFP 4610.1010).
- Procedures followed when joining pipe with Continental compression fittings (GFP 4610.1020).
- Procedures followed when joining pipe with Lycofit mechanical fittings (GFP 4610.1030).
- Procedures followed when joining threaded pipe (GFP 4610.1040).
- Welded service tee fitting has cooled before installing PE pipe into Continental fitting (GFP 4610.1020, step 3).
- Shear point protected where PE pipe connects to Continental service tees fitting (GFP 4610.1020 pg 3, step 4 (OS 2550.2000 sec 5.4.1).

Notes and Best Practices: When joining pipe, PE pipe must be inspected to ensure there are no cuts, gouges, or scrapes deeper than 10% of the wall thickness (OS 2525.1200 sec 6.13.2). This requirement should be checked under the Inspection Item: Pipe – General Installation/Retirement Requirements.

Inspection Steps:

1. **Proper GFP is being followed for specific fitting to be installed.**
2. **Inspect fitting during and after installation.**
3. **Pipe dope used when installing threaded fittings.**
4. **Proper torque specs. Used on flanged fittings.**
5. **Lyco fittings installed per GFP.**
6. **Document findings in QA&I database.**
7. **Note any deviations, if deviations are found, call area superintendent and email report to all on the QA&I deviation list.**

Inspection Item: Tapping/Stopping

Pertains to:

Tapping and Stopping of all steel pipe for low pressure, intermediate pressure and high pressure systems. It does not pertain to service tees using a self-contained perforator.

Calculation of points:

One point maximum for each Tap or Stop observed.

Inspection Checks:

- ✔ Field personnel performing hot taps on gas pipelines are Operator Qualified and new employees that are not currently qualified for a covered task shall not be allowed to perform that task unless they are directly observed during performance of that task (OS 2700.1000 sec 2.1.1, 2.1.2 and OS 2425.2100 sec 5.1).
- ✔ No person may be in a hot tap crew unless they have been qualified by the provisions of Operating Standard (OS 2700.1000 sec 3.1 and sec 5.1).
- ✔ Equipment used for the hot tap operation shall be qualified for use on company pipelines if it meets the provision of Operating Standard 2700.1050 section 3.1 and is used in accordance with the manufacture's recommendations (OS 2700.1050 sec 3.1).
- ✔ When using the equipment, the manufacturer's procedures manual shall be on site, except, if there is a field procedure that covers the use of the equipment then the manufacturer's procedure manual does not need to be on site (OS 2700.1050 sec 3.1.1).
- ✔ The equipment shall be kept in good working condition and shall be inspected at intervals not exceeding one year. Parts showing excessive wear and or deterioration shall be replaced before the equipment is used again (OS 2700.1050 sec 3.2).
- ✔ Procedures followed when hot-tapping PE branch saddles (GFP 4600.1100).
- ✔ No smoking or open flames in areas or structures where a combustible mixture of gas and air may exist (OS 2575.2000 sec 3.2.2).
- ✔ When a hazardous amount of gas is being vented into open air, or the work process could result in an uncontrolled release of gas, such as welding, fusing, squeezing, or tapping on live gas lines, at least one fire extinguisher shall be available at the work site prior to any individual entering or beginning work in the hot zone. Refer to Section 4.3 of this Operating Standard for policy on manned extinguishers (OS 2575.2000 4.1).

Notes and Best Practices: Never use a rubber stopper when repair welding is required on the inlet or outlet connections of the fitting being stopped. Count the number of turns required to fully close a specific gate valve control chamber before performing the procedure. Always monitor pipe pressures before and after dropping a stopper.

Considerations before doing a Tap/Stop:

- Is the pipe a one or two way feed?
- If it is a one way feed, what is the direction of gas flow?
- Exactly how much piping is involved?
- How many customers are on the line?
- What are the pressures in all pipe involved?
- If a bypass is to be run, is it large enough to maintain flow?

Inspection Steps:

1. **Inspect tapping equipment to make sure it is in good operating condition.**
2. **Inspect for proper manufacturers manual.**
3. **Inspect to make sure proper procedures are followed.**
4. **Fire extinguisher is on site during tapping and stopping procedure.**
5. **Fitting is soaped out once completed.**
6. **Document findings in QA&I database.**
7. **Note any deviations, if deviations are found, call area superintendent and email report to all on the QA&I deviation list.**

Inspection Item: CP Requirements

Pertains to:

Cathodic protection requirements such as exposed pipe inspection, taking PSP reads, anode installation, thermite welds, test station and lead installations. Anode installations for locate wire are audited under the inspection item for Locate Wire.

Calculation of points:

One point maximum for each pipe condition requirement/inspection.

Inspection Checks:

- Except as provided in section 4.5.2.3, each repair fitting installed for a corrosion leak repair on unprotected bare-steel pipe and each new steel fitting installed or pipe welded on unprotected bare- steel pipe shall have a 32-pound anode installed (OS 2600.2000 sec 4.5.2).
- PSP readings shall be taken as soon as possible after exposing steel pipe (OS 2575.2800 sec 3.1.2).
- Procedures followed when taking PSP reads (GFP 4515.1210 and GFP 4515.1205).
- The requirements of this section (Examination of buried steel pipe when exposed) shall be performed and recorded on the Exposed Pipe Condition Report as soon as possible after exposing steel pipe (OS 2575.2800 sec 3.3).
- If corrosion is found on cathodically protected wrapped pipe, the Manager Gas System Integrity shall be notified immediately, before pipe is wrapped and the excavation is backfilled (OS 2575.2800 sec 3.1.3).
- Personnel who remove a pipe segment shall be responsible for ensuring the pipe is inspected (internal corrosion) and completing an “Exposed Pipe Condition Report” (OS 2600.1700 sec 7.1).
- If internal corrosion beyond surface rust is found, the Manger Gas System Control shall be notified immediately of the condition prior to backfilling the excavation (OS 2600.1700 sec 4.2).
- Where PE main is extended from steel main a test lead is installed on the steel main and brought to the surface (OS 2600.1200 table 4-1 and OS 2525.2300 sec 5.2). Note: refer to the Inspection Item “Locate Wire” for inspection of the locate (tracer) wire.
- Test leads attached to steel pipe by thermite weld (OS 2600.1200 sec 5.1.1.1).
- Installed second backup wire (OS 2600.1200 sec 5.1).
- Allow enough extra wire to extend leads 18” outside of the box (GFP 4510.1020 pg 2 step 4).
- Test leads shall be terminated only in a CP test box not in any valve box. Exceptions must be approved by Manager Gas System Control (OS 2600.1200 sec 5.2).
- CP test boxes shall be located outside of vehicular traffic areas if at all possible (OS 2600.1200 sec 5.2.1).
- Procedures followed when bonding conductors to steel or pipe (GFP 4510.1040).
- Hot Spot protection installed for corrosion leak repairs on unprotected bare steel pipes (OS 2600.2000 sec 4.5.2).
- Isolated steel services or riser have an anode installed (GFP 4510.1000 fig 7).
- Anode leads brought up in a CP test box shall be labeled with an “A” tag (OS 2600.2000 sec 4.2).
- Anode shall be placed at or below pipe depth, and at least 6 inches away from the pipe (OS 2600.2000 sec 3.1).
- Isolated steel wrapped services allowed to remain after construction shall be cathodically protected and assigned a test site number (OS 2525.2100 sec 4.6.1).
- Cut and capped steel service not retired at main has test station installed near the end (GFP 4510.1000 pg 10 of 14 fig 6 & OS 2600.1200 pg 2 of 3 table 4-1).
- Procedures followed when installing CP test stations (GFP 4510.1020).
- CP test box lid painted white (GFP 4510.1020 page 2 step 6).
- An insulated fitting is required immediately downstream of the inside shut off valve (OS 2550.1900 sec 4.4.3).
- A Cathodic protection of the new or repaired tracer wire shall have a PSP read of less than -0.5V. (OS 2600.2000 sec 4.4.3.2).

continued

Notes and Best Practices: For anode installations, do not remove or damage the cloth bag and do not lift the anode by the wire. (GFP 4510.1000)

Inspection Steps:

1. **Were psp reads taken when main is exposed & when job is completed.**
2. **Inspection of existing main completed per GOS.**
3. **Proper anode or test leads installed per GOS and GFP.**
4. **Test leads tagged properly and extend out of wire box per GOS.**
5. **Document findings in QA&I database.**
6. **Note any deviations, if deviations are found, call area superintendent and email report to all on the QA&I deviation list.**

Inspection Item: Coatings on Buried Pipe

Pertains to:

The field application of coatings for external corrosion protection of gas piping.

Calculation of points:

One inspection point for each 10' segment of pipe inspected on site.

Inspection Checks:

- Be applied on a properly prepared surface (OS 2600.1100 sec 4.1.1).
- Have sufficient adhesion to the metal surface to effectively resist under film migration of moisture (OS 2600.1100 sec 4.1.2).
- Pipe is properly cleaned and prepared (GFP 4510.1100 pg 3 and GFP 4510.1110 pg 2).
- When applying cold-applied pipe tape the edges of the existing pipe coating are feathered and the existing coating is abraded 3 to 4 inches from the coating edge (GFP 4510.1100 pg 3 step 2).
- Verify tape primer is applied overlapping the original coating 3 to 4 inches and allowed to dry until tacky to the touch (GFP 4510.1100 pg 5 step 4).
- Tape applied with minimum ½ inch overlap GFP 4510.1100 pg 5 step 4).
- Vertical above ground pipe taped directionally from bottom to top to shed water (GFP 4510.1100 pg 5 step 5).
- When used in combination with mastic, tape shall be applied prior to the application of mastic on irregular fittings (GFP 4510.1100 pg 4).
- When installing pipe, prior to lowering pipe into ditch, all external protective coatings shall be visually inspected (OS 2525.2700 sec 7.2.2).
- Each external protective coating protected from damage resulting from adverse ditch conditions or damage from supporting blocks (OS 2600.1100 sec 4.3 &OS 25252700 sec 7.2.1.1).
- Before applying mastic, oil/grease removed with solvent and cleaned metal allowed to dry thoroughly (GFP 4510.1120 pg 2, step 4).
- Applying cold- applied Mastic (GFP 4510.1110 pg .2).
- Applying Wax tape (GFP 4510.1130)
- All piping to and from vault is wrapped up to the first fitting inside the vault (OS 2600.1100 sec 6.1).
- All piping components in vault are coated with approved corrosion resistant coating (OS 2600.1100 sec 6.2).
- Procedures followed when installing heat-shrinkable sleeves (GFP 4510.1010).
- Person installing sleeve has certification card from the manufacturer or their representative the specific sleeve type (GFP 4510.1010 pg 1).
- Sleeves only used on steel pipe coated with fusion bond epoxy, polyethylene, or urethane (GFP 4510.1010 pg 1).
- Sleeve overlaps the existing coatings by a minimum of 2" (GFP 4510.1010 Fig. 3).
- Completed sleeve visually inspected to ensure the sleeve adhesive, which bonds to the coating and extrudes at all shrink sleeve overlaps (GFP 4510.1010 pg 5 step 1).
- Completed sleeve installation never reheated (GFP 4510.1010 pg 6).
- Sleeve that fails inspection is never repaired but only replaced (GFP 4510.1010 pg 5).
- When tying in a transition fitting to existing bare steel main, the main shall be wrapped for a minimum of 1 foot from the transition fitting and the wrap shall overlap the coating on the fitting by at least 3 inches (OS 2600.1100 sec 5.5).
- When installing wrapped steel fittings or pipe (such as service tees, couplings, and repair clamps) on existing bare steel main, the main shall be wrapped for a minimum of 1 foot on either side of the fitting (OS 2600.1100 sec 5.4).
- On bare steel pipe ensured all portions of the cleaned pipe are covered per the Procedures (GFP 4510.1100 page 3 step 2 & page 4 step 4).
- See waivers for Solvents / Degreasers and Cleaners.

continued

Inspection Steps:

1. **Existing pipe cleaned per GFP's.**
2. **Wrap installed per GFP.**
3. **Inspect final wrap to make sure GFP requirements are met.**
4. **Document findings in QA&I database.**
5. **Note any deviations, if deviations are found, call area superintendent and email report to all on the QA&I deviation list.**

Inspection Item: Compaction

Pertains to:

Inspecting the process of compacting the backfill material.

Calculation of points:

Compaction points are calculated using the 100' rule. One point for all compaction along 100 lineal feet of trench. Each additional 100' section inspected counts as an additional point.

Inspection Checks:

- Back fill material shall be compacted in lifts thick enough to prevent damage to the pipe. If the trench is wide enough, the spaces to the sides of the pipe shall first be compacted (OS 2525.1800 sec 6.4).
- When compaction is performed by powered hand-operated equipment (e.g. big foot, jumping jack), the initial backfill lift over the pipe shall be a minimum of 12” (OS 2525.1800 sec 6.2.2).
- When compaction is performed by machine operated equipment (e.g. hoe-pack, hydro-hammer), the initial backfill lift over the pipe shall be a minimum of 24” (OS 2525.1800 sec 6.2.3).
- All backfill shall be consolidated according to the terms of applicable permits and right of way agreements (OS 2525.1800 sec 6.1.1).
- Undercutting of paving shall be limited to 12” (OS 2525.1700 sec 5.5.1).

Notes and Best Practices: When walking over compacted soil or patches check for softness or pumping. Pumping soil should be checked as unsatisfactory under this inspection item. When observing backfill being compacted, the crew must take care to avoid damage to the buried gas facilities and other underground lines. Also care must be taken when compacting around service and branch connections and points of transition between PE and steel to insure well-compacted support and to protect the pipe and fittings from excessive external loads.

continued

If a temporary patch or final asphalt on hard surface area is sunken or coming apart due to spongy final backfill then the deviation should be captured as "Compaction". This is because the primary cause of the problem can be attributed to failure to have properly compacted final backfill underneath the temporary patch.

If the cold mix in a temporary patch is being kicked from the area by vehicles, but the ground under a temporary patch site appears firm and well compacted, the problem should be captured as "Restoration". This is because properly installing cold mix as a temporary patch is part of restoration on the job. The expectation is that the temporary patch should last until the permanent asphalt is in place.

Inspection Steps:

1. **If crew on site - Inspect if Compaction is completed per GOS requirements (proper equipment/in lifts/suitable material).**
2. **Post inspects, patches are flush with existing hard surface.**
3. **Check for settlement where service or main had excavations.**
4. **Check for proper distance between edge of hard surface and new valve box installation.**
5. **Confirm that crew did not undercut paving more than 12”.**
6. **Document findings in QA&I database.**
7. **Note any deviations, if deviations are found, call area superintendent and email report to all on the QA&I deviation list.**

Inspection Item: Pipe – General Installation/Retirement Requirement

Pertains to:

Various requirements, such as branching mains, bridge and vault installations, pipeline markers, weak link, radius bend and retirement requirements.

Calculation of points:

One point maximum for inspection pertaining to general installation/retirement requirements.

Inspection Checks:

- If the pipeline is not going to be placed into service immediately, the system shall be fitted with a gauge and left pressurized with air at or below 60 psi (OS 2525.3300 sec 3.7).
- The riser shall be installed in a way to ensure that the PE service does not support any external loads (OS 2525.1200 sec 6.2.1).
- Branch connections are installed using tees specified in standards (OS 2525.1200 sec 5.2 and 5.2.1)
- Main wraps around the end of cul-de-sac approximately 3 feet beyond the proposed meter location of the last house to be served unless the last house can be twinned (OS 2525.1300 sec 4.5.2 and figure 4.1)
- Main shall be 2 inch diameter and larger, except as noted in Standards (OS 2525.1300 sec 5.3).
- Mains and services shall not be installed under concrete slabs adjoining a manufactured/mobile home or recreation vehicles foundation w/o approval from Manager Standards (OS 2525.3100 sec 2.3 and 4.2.1).
- PE pipe shall not be installed in vaults or any other below ground enclosure (OS 2525.1200 sec 6.5.)
- Where pipe extends through the vault wall, provision must be made to prevent passage of gases or liquids through the opening and to avert strains in the pipe (OS 2525.3200 sec .3.3).
- All hangers used to support exposed pipelines (bridge crossings, etc.) shall be selected that the hanger is not directly welded to the pipe and such that the hanger completely supports the pipe and secures it from lateral movement (2525.2400 sec 3.2.1 see 2525.2400 table 4.1 for sizing and spacing).
- Free expansion and contraction of the pipeline between supports or anchors is not restricted (OS 2525.2400 sec 3.3.1).
- When steel piping is supported or anchored, the carrier pipe shall be insulated from the support or anchor (OS 2525.2400 sec 3.4 and 2600.1400 section 4).
- Pipeline marker and warning sign locations and requirements followed as specified in the Standards (OS 2525.2500 section 4 and class table 4.1).
- Before installation, the field crew shall verify the accuracy of the designed marker locations and adjust the locations as needed. In addition the crew shall install additional markers if in their judgment they are required or advised (OS 2525.2500 sec 3.4).
- One-Call Center notified and locates requested (OS 2425.1600 sec 3.3).
- Trench bottom shall be evenly graded to provide firm support along the entire length of the pipeline (OS 2525.1700 sec 5.3).
- Used approved weak link when pulling PE pipe by mechanical means (OS 2525.1200 sec 6.15 and OS 2525.2200 table 9.2).
- PE damage greater than 10% identified and removed (OS 2525.1200 sec 6.13 & 9.3.1).
- One-Call Center notified and locates requested (OS 2425.1600 sec 3.3).
- Trench bottom shall be evenly graded to provide firm support along the entire length of the pipeline (OS 2525.1700 sec 5.3).
- All excavated materials shall be removed and temporary steel plating or paving shall be provided and maintained at pavement openings at all times that work is not in progress (OS 2525.1700 sec 5.5.3).
- JT gas facilities located on the roadside of the trench (OS 2525.1500 sec 4.2).
- No metal objects used to maintain separation from other utilities (OS 2525.1200 sec 6.7.2)
- Service deactivated as required in Standards (OS 2525.2100 sec 6 and OS 2525.3600 sec 5 and OS 2525.3650).
- Mains deactivated as required in Standards (OS 2525.2100 sec 5 and OS 2525.3600 sec 4).

continued

Inspection Checks, *continued*:

- Verify the minimum (long-term) bend radius is not exceeded after the pipe is installed per (OS 2525.1200 sec 10.1).
- When the required bend radius is less than the minimum long term bend radius, butt fusion ells or tees shall be used (OS 2525.1200 sec 10.1.1).
- Techniques for temporary erosion and sediment control (GFP 0150.3200)
- Stabilizer bar on the riser is at 90 degrees (GFP 4575.1030 pg 2 step 9).

Notes and Best Practices: In joint trench applications sand bags, staking (plastic or wooden stakes), plastic separators, shading, or other appropriate means may be used to control excessive snaking of the gas pipe. Per S&WP (2001)

Inspection Steps:

1. **When digging up service riser, foot is at 90 degrees.**
2. **Weak link being used when pulling in PE pipe by mechanical means.**
3. **Main and service retirement done per GOS.**
4. **Pipelines not placed into service immediately are left pressurized with a gauge at or below 60 psi.**
5. **Document findings in QA&I database.**
6. **Note any deviations, if deviations are found, call area superintendent and email report to all on the QA&I deviation list.**

QA&I INSPECTION FOR HIGH PRESSURE

Inspection Item: Materials Handling, Storage and Transportation

Pertains to:

The handling, storage and transportation of materials pertaining to the installation of gas piping.

Calculation of points:

One point maximum for inspection pertaining to materials handling, storage and transportation.

Inspection Checks:

- All steel pipe shall be stored at least 6 inches above the ground.(OS 2450.1400 sec.3.2.1)
- All steel pipe should be stored with one end slightly elevated to aid water drainage. (OS 2450.1400 sec 3.2.2).
- All steel pipe shall be stored such that the supports are spaced to keep the pipe straight, parallel, and without a downward center bow. (OS 2450.1400 sec. 3.2.3).
- When storing, handling, and transporting steel pipe (including transportation by crew trucks), be careful to maintain the pipe's integrity and ensure it is suitable for installation. (OS 2450.1400 sec. 3.1).
- Steel pipe stored horizontally shall meet the requirements of (OS 2450.1400 sec. 3.2 and sec. 4).
- Any pipe laid along a ditch line shall be laid on burlap sacks, wooden blocks, or other suitable supports to protect the coating from rocks or sharp objects. (OS 2450.1400 sec.4.4.1).
- Coated pipe shall be unloaded and set into place in the field by means that will not disturb the coating. (OS 2450.1400 sec. 5.3.1).
- Transportation of pipe from PSE facilities by PSE or contractor to another site shall be accomplished in accordance with the purchase specification for that type of pipe and coating. (OS 2450.1400 sec. 6.2.1).
- Any damage to the pipe or coating incurred during the transport by the contractor is the contractor's responsibility. (OS 2450.1400 sec. 6.2.2).
- Pipe shall not be dragged from a parked or moving vehicle. (OS 2450.1400 sec. 5.3.2).
- Any pipe stored along a high voltage power line right of way should be grounded on one end only with a minimum #14 copper wire to prevent the buildup of static electricity. (OS 2450.1400 sec.4.4.3).

Inspection Steps:

1. **Pipe stored at job site per GOS.**
2. **Proper equipment used to handle and transport pipe. Slings or clamps used so coating is not damaged.**
3. **Crew members not walking or stepping on installed pipe unless necessary.**
4. **Document findings in QA&I database.**
5. **Note any deviations, if deviations are found, call area superintendent and email report to all on the QA&I deviation list.**

Inspection Item: Job Site Materials Inspected

Pertains to:

The inspection of materials to be used on job site, such as pipe, fittings, flanges and bolts.

Calculation of points:

One point maximum for inspection pertaining to job site materials inspected.

Inspection Checks:

- Each flange or flange accessory shall meet the minimum requirements of ASME B16.5, MSS SP-44, or the equivalent. (OS 2450.1000 sec. 7.1).
- Each flange assembly shall be able to withstand the maximum pressure at which the pipeline is to be operated, and to maintain its physical and chemical properties at any temperature to which it is anticipated that it might be subjected in service. (OS 2450.1000 sec. 7.2).
- Each steel butt-welding fitting shall have pressure and temperature ratings based on stresses for pipe of the same or equivalent material. (OS 2450.1000 sec.8.2).
- All pipeline components shall meet the requirements of this Operating Standard and the appropriate written specifications. (OS 2450.1000 sec. 3.1).

Inspection Steps:

1. **Steel pipe received at the job site shall be inspected for pipe grade, wall thickness, bevel, coating condition, coating thickness and overall condition of pipe.**
2. **Confirm fittings and pipe is appropriate for the job to be installed.**
3. **Does the fitting to be welded to a weld o let require taper boring?**
4. **Document findings in QA&I database.**
5. **Note any deviations, if deviations are found, call area superintendent and email report to all on the QA&I deviation list.**

Inspection Item: Correct Weld Procedure Used

Pertains to:

The inspection of the correct weld procedure being used.

Calculation of points:

One point maximum for each correct weld procedure used.

Inspection Checks:

- Identify welding type (e.g., butt weld or fillet weld). (4900.1200)
- Identify welding method (e.g., arc, oxyacetylene, et cetera). (4900.1200)
- Identify pipe size, grade, wall thickness, and fitting size (if necessary). (4900.1200)
- When joining pipe of two different grades, use the procedure for the higher grade. (4900.1200)

Inspection Steps:

1. **Confirm that welder knows the procedure that is to be used.**
2. **Proper filler metal is being used.**
3. **Pre heating is done if applicable.**
4. **Document findings in QA&I database.**
5. **Note any deviations, if deviations are found, call area superintendent and email report to all on the QA&I deviation list.**

Inspection Item: Welds

Pertains to:

The visual inspection of completed welds.

Calculation of points:

One point maximum for each weld that is visually inspected.

Inspection Checks:

- Qualified inspectors shall periodically inspect the condition of pipe and components and the quality of the installation and welding of steel piping. Inspection shall ensure that all work conforms to PSE Operating Standards. (OS 2525.2700 sec. 7.1).
- Weld inspection, and repair or removal of unacceptable welds, shall meet the requirements of Welding Standard 2700.1200. (OS 2525.2700 sec. 7.2).
- If a production weld is not satisfactory, three additional production welds shall be cut out and tested within the next 10 working days. If any of the three welds are not satisfactory, the welder must demonstrate additional training acceptable to the Company and must be re qualified by passing the appropriate welding test. (OS 2525.2700 sec. 7.3).
- During production welding, the Company's authorized representative may request immediate re qualification or disqualification of any welder who produces unacceptable welds or does not demonstrate the necessary welding skills, even though the welder's qualifications may be current. (OS 2525.2700 sec. 7.4).
- All Company facilities shall be inspected before backfilling, or being placed into service for aboveground facilities, to ensure that they are constructed in accordance with this Operating Standard. (OS 2525.2700 sec. 7.5).
- Each length of pipe and all components shall be inspected at the installation site immediately before placement into the ditch to ensure that there is no visually determinable damage that could impair its serviceability. (OS 2525.2700 sec. 7.5.1).
- Each imperfection or damage that impairs the serviceability of a length of steel pipe shall be removed unless an acceptable repair is reviewed and approved by the Manager Standards and Manager Engineering to ensure all regulatory requirements are met. Welds shall be repaired in accordance with Welding Standard 2700.1200. (OS 2525.2700 sec. 7.5.1.1).

Inspection Steps:

1. **Visual inspection shall be conducted on every weld to ensure that the welding is performed in accordance with the welding procedures included in the Field Procedures manual.**
2. **The welds shall meet the standards of acceptability for visual inspection as specified in API Standard 1104 as determined by weld inspectors qualified in accordance with Operating Standard 2700.1300.**
3. **Nondestructive testing of welds shall be performed in accordance with written procedures and by persons who have been trained and qualified in the established procedures and with the equipment employed in testing.**
4. **Radiographically examined welds shall meet the standards of acceptability of API Standard 1104.**
5. **Pipelines designed to operate at a pressure which produces a hoop stress of 20% or more of the specified minimum yield strength (SMYS) shall be radiographically examined in addition to visual inspection.**
6. **Document findings in QA&I database.**
7. **Note any deviations, if deviations are found, call area superintendent and email report to all on the QA&I deviation list.**

Inspection Item: Bending Steel Pipe

Pertains to:

The bending of steel pipe.

Calculation of points:

One point maximum for each steel pipe bend that is visually inspected.

Inspection Checks:

- A bend shall not impair the serviceability of the pipe. (OS 2525.2700 sec.5.1).
- Field bending of steel pipe shall be accomplished by a cold bending method that produces a smooth, uniform contour with a minimum radius in accordance with Table 5-1. (OS 2525.2700 sec. 5.2).
- Ovality of steel pipe after bending shall be calculated according to the following formula: Ovality (%) = {[(Max. OD) -- (Min. OD)] (Nominal OD)} x 100. (OS 2525.2700 sec. 5.3).
- The ovality at the pipe ends shall be less than 2.5 %.(OS 2525.2700 sec.5.3.1).
- The ovality over the entire pipe shall be less than 5 %.(OS 2525.2700 sec. 5.3.2).
- The pipe shall be free from buckling, cracks, or any other mechanical damage and shall conform after bending to the profile of the completed ditch. (OS 2525.2700 sec. 5.4).
- There shall be no wrinkle bends or mitered bends, except deflections up to 3 degrees that are caused by misalignment are allowed. (OS 2525.2700 sec. 5.5).
- Pipe bends shall not be made within one and one-half pipe diameters of a circumferential weld. Refer to Welding Standard 2700.1200 for nondestructive testing requirements of welds in proximity to bends. (OS 2525.2700 sec.5.7).
- Steel pipe shall not be bent within 5 feet of the end of the pipe segment being bent. (OS 2525.2700 sec. 5.8).
- If pipe contains a longitudinal weld, the weld shall be as near as practicable to the neutral axis of the bend (see Figure 5-1), unless the bend is made with an internal bending mandrel; or the pipe is 12 inches or less in outside diameter or has a diameter to wall thickness ratio less than 70.(OS 2525.2700 sec. 5.9).

Inspection Steps:

1. **Confirm proper bending shoes are being used for the size of pipe being installed.**
2. **Pipe seam is located on the pipe and oriented to the neutral axis.**
3. **Bend is not made within 5 feet of the end of a pipe segment.**
4. **Check ovality and for wrinkles.**
5. **Does the bended pipe fit the ditch without undue stress?**
6. **Did the bend engineer use the proper procedure?**
7. **Document findings in QA&I database.**
8. **Note any deviations, if deviations are found, call area superintendent and email report to all on the QA&I deviation list.**

Inspection Item: Jeeping

Pertains to:

Jeeping the coating on wrapped steel pipe.

Calculation of points:

One point maximum for each section of piping that is jeeped.

Inspection Checks:

- Bent pipe shall be visually and electronically inspected ("jeeped") in the same manner as straight joints. Jeeping shall be done in accordance with Field Procedure 4515.1400.
- External coatings on newly installed steel pipe 2 inches in diameter or greater shall be electronically inspected (jeeped) in accordance with Field Procedure 4515.1400. (OS 2525.2700 sec. 7.5.2.1).
- This requirement applies to pipe and butt welded pipe joints (including final tie-in joints).
- All detected coating defects ("holidays") shall be repaired. (OS 2525.2700 sec. 7.5.2.1.1).
- Coating repairs shall be jeeped after completion of the repair. (OS 2525.2700 sec.7.5.2.1.2).

Inspection Steps:

1. **Review jeeping procedure (GFP 4515.1400) with personnel responsible for wrapping pipe.**
2. **Jeeping of pipe in all bell holes is required.**
3. **Pipe shall not be left unshaded over night. If it is, the pipe will need to be jeeped the following day. Or rock shield used.**
4. **Proper grounding of the jeep machine will be required.**
5. **If repairs are made to the pipe coating, all repairs will be re-jeeped.**
6. **Crew shall be responsible to check voltage every day.**
7. **Document findings in QA&I database.**
8. **Note any deviations, if deviations are found, call area superintendent and email report to all on the QA&I deviation list.**

Inspection Item: Testing

Pertains to:

The testing of High Pressure piping.

Calculation of points:

One point maximum for each pipe segment that is tested.

Inspection Checks:

- The Manager Engineering, or their designee, shall be responsible for developing written procedures for all tests for pipelines, except for service lines, designed to operate above 60 psig. (OS 2525.3300 sec. 2.1.1).
- Approving test results on pipelines, except for service lines, designed to operate above 60 psig. (OS 2525.3300 sec 2.1.2).
- All new, relocated, replaced, or temporarily abandoned pipelines shall be tested before being placed in service in accordance with the provisions of this Operating Standard.(OS 2525.3300 sec. 3.1)
- All leak and strength tests shall be performed on pipe after it has been installed, and backfilled, at a minimum, with initial backfill as specified in Operating Standard 2525.1800,except as allowed in Section 3.1.2.(OS 2525.3300 sec. 3.1.1).
- Pipeline repairs and certain fabricated units and short sections of pipe (such as valve sections and purge connections) may be tested prior to installation and/or backfill as applicable. (OS 2525.3300 sec. 3.1.2).
- A preliminary leak test shall be conducted at a pressure between 100 psig and 150 psig or the pressure that produces a hoop stress of less than 20%, whichever is less. (OS 2525.3300 sec.6.5.1).
- The preliminary leak test pressure shall be maintained for 15 minutes. (OS 2525.3300 sec. 6.5.1.1).
- All exposed piping shall be tested with soap suds during the test period. (OS 2525.3300 sec. 6.5.1.2).
- The gauge pressure shall not drop during the test period, unless the test is
- instrumented for temperature and approved by the Manager Engineering. (OS 2525.3300 sec.6.5.1.3).
- Except as required in Section 6.5.5, when air, nitrogen, or natural gas is used as the test medium, the test pressure shall be maintained for the minimum period of time listed in Table6-1, unless otherwise indicated in the written procedure. In no case shall the test duration be less than 1 hour.(OS 2525.3300)
- Each length of pipe used to tie-in a test segment shall be made from pretested pipe. (OS 2525.3300 sec. 6.7).
- Each joint used to tie-in a test segment shall be leak tested with soap suds at the operating pressure when placed into service.(OS 2525.3300 sec.6.9)

Strength Test Requirements:

The test pressure shall be at least 1.5 times the proposed pipeline MAOP and shall be maintained for a minimum period of 24 hours unless otherwise indicated in the written procedure (the written procedure shall not specify test duration less than 8 hours) or as allowed in Section 7.6.4. (OS 2525.3300 sec.7.6.1).

Deadweight pressure readings shall be taken at one hour intervals.

Temperature readings shall be taken from thermocouples installed on the pipeline as shown on the design drawings. During the test period, temperature data provided by the thermocouples shall be recorded at the same regular intervals as the pressure readings. (OS 2525.3300 sec. 7.6.3)

Inspection Steps:

1. **Review testing procedures**
2. **Check installation of thermocouples.**
3. **During tests, assure all exposed fittings are soap tested**
4. **Check with PSE Pressure Control on test results**
5. **After tests are approved, assure the test pressure has been reduced or blown down flat, per GOS2525.3300.**
6. **Document findings in QA&I database.**
7. **Note any deviations, if deviations are found, call area superintendent and email report to all on the QA&I deviation list.**

Inspection Item: Pigging

Pertains to:
Pigging segments of pipeline.

Calculation of points:
One point maximum for each segment of piping that is pigged.

Inspection Checks:

- Keep the line free of debris during construction. If the main is 4 inches or larger in diameter and greater than 100 feet in length, the pipe shall be pigged to clean out the line prior to placing it in service.(OS 2525.2700 sec. 3.1.1)
- When the pipeline is designed to accommodate pigging, all 3R fittings (or transverse segments of 3Rfittings) shall be installed with a minimum of 3 feet of separation between the 3R fitting (or transverse segments of 3R fittings), unless otherwise approved by the Manager Engineering. (OS 2525.2700 sec.3.16).
- Except as provided in Sections 6.2 and 6.3, each new transmission line and each replacement of line pipe, valve, fitting, or other line component in a transmission line must be designed and constructed to accommodate the passage of instrumented internal inspection devices. (OS 2525.1100 sec. 6.1).
- Per HP job procedures, if hydrostatic testing is required, follow written procedures for de-watering piping.

Inspection Steps:

1. **Confirm proper pig is being used for each application.**
2. **When running any type of brush pig, a pig catcher that is welded to the pipe is required.**
3. **Make sure pig(s) have been installed at end of header.**
4. **Verify the completion of pigging the gas main.**
5. **On HP job, verify dewatering has been completed per written procedure.**
6. **Document findings in QA&I database.**
7. **Note any deviations, if deviations are found, call area superintendent and email report to all on the QA&I deviation list.**

Inspection Item: Trench Requirements

Pertains to:

Job site trenching requirements.

Calculation of points:

One point maximum for each trench requirement inspected.

Inspection Checks:

- 3.5 Each external protective coating shall be protected from damage resulting from adverse ditch conditions or damage from supporting blocks. (OS 2525.2700 sec. 3.5).
- When installed in the ditch, the pipe shall be placed so that it fits the ditch without the use of external force to hold it in place. (OS 2525.2700 sec. 3.7).
- Each pipeline and related facilities shall have sufficient support to: Prevent undue strain on connected equipment and not be supported by other piping; Resist longitudinal forces caused by a bend or offset in the pipe; and, Prevent or damp out excessive vibration. (OS 2525.2700 sec.3.1).

Inspection Steps:

1. **Ditch is wide enough to accommodate pipe without undue stress.**
2. **If ditch is over 4 feet deep, shoring is installed.**
3. **Pipe is properly supported if ditch is over dug.**
4. **Sandbags used to support the pipe off of the bottom of the ditch.**
5. **Ditch is wide enough to allow initial backfill to flow underneath the bottom of the pipe.**
6. **Inspect trench for safety requirements.**
7. **Trench is clear of rocks or any other items that may damage the pipe or pipe coating.**
8. **Document findings in QA&I database.**
9. **Note any deviations, if deviations are found, call area superintendent and email report to all on the QA&I deviation list.**

Inspection Item: Preventing Accidental Ignition

Pertains to:

The prevention of accidental ignition.

Calculation of points:

One point maximum for each inspection.

Inspection Checks:

- Bonding cables shall be firmly attached to both sides before steel pipe is cut or reconnected. (OS 2575.2000 sec. 3.5).
- Repairs involving flame cutting of pipe shall be made in a gas free atmosphere. (OS 2575.2000 sec. 3.4.1).
- Prior to welding, cutting, or other hot work in or around a structure, area, or facility containing gas, a check shall be made for the presence of gas. Work shall begin only when safe conditions are present. (OS 2575.2000 sec. 3.3.1).
- Whenever purging, venting, or aspirating operations are taking place; ensure that the venting stream is directed up and away from traffic, pedestrians, and potential sources of ignition; and ensure that the vent stack is secured in place. (OS 2575.2000 sec.3.2.1).
- Gas or electric welding or cutting shall not be performed on pipe or pipe components that contain a combustible mixture of gas and air in the area of work. This includes pipe not under pressure that contains gas. (OS 2575.2000 sec. 3.3).
- When a hazardous amount of gas is being vented into open air, or the work process could result in an uncontrolled release of gas, such as welding, fusing, squeezing or tapping on live gas, at least one fire extinguisher shall be available at the work site. (OS 2575.2000 4.1).
- The fire extinguisher shall be removed from the vehicle, inspected for serviceability, and placed upwind of the work site in a location where it is available for immediate use. (OS 2575.2000 4.1.2).
- When there is a controlled release of gas, a manned fire extinguisher is required any time the control valve is 2 inches or larger. (OS 2575.2000 sec. 4.3.4).

Inspection Steps:

1. **Inspect area to check for potential ignition sources.**
2. **When work tasks are being performed, check for fire extinguisher requirement.**
3. **Bonding cables used when required.**
4. **Fire extinguishers on site and available.**
5. **Document findings on QA&I database.**
6. **Note any deviations, if deviations are found call area superintendent and email all on the QA&I deviation list.**

Inspection Item: Main Valve

Pertains to:

The inspection of main valve installation.

Calculation of points:

One point maximum for each main valve inspected.

Inspection Checks:

- Buried valves shall be installed with an approved valve box and lid such that the lid is visible and flush with the existing ground surface. (OS 2525.2600 sec. 3.4.3).
- If a valve is installed in a buried box or enclosure, the box or enclosure shall be installed so as to avoid transmitting external loads to the main. (OS 2525.2600 sec. 3.5).
- Valves shall not be installed in inaccessible locations. (OS 2525.2600 sec. 3.6.3.1).
- High pressure block valves shall be supported to prevent settling of the valve or movement of the pipe to which it is attached. See standard concrete valve support design for more information on designing concrete valve supports. (OS 2525.2600 sec. 5.6).
- Each high pressure main and transmission line shall have sectionalizing block valves. (OS 2525.2600 sec. 5.1).
- High pressure block valves should be installed at intervals: Not to exceed one mile, if practical, but at no time shall the interval be more than two miles unless the pipeline is installed in a sparsely populated area. (OS 2525.2600 sec. 5).
- Not to exceed five miles for pipelines installed in sparsely populated areas. The primary objective is to locate valves in these areas to maximize accessibility. (OS 2525.2600 sec. 5).

Inspection Steps:

1. **Verify ANSI pressure class rating is correct on the tag and on the valve body.**
2. **Valve is correct type and design based on the job site prints.**
3. **Confirm with Pressure Control that the valve has the correct number of turns on the operator.**
4. **Prior to installation, HP valves greased by Pressure Control.**
5. **Valve installed per design or GOS requirements.**
6. **Valve supported as required.**
7. **Valve box & grease fittings installed per requirements.**
8. **Lids painted proper color.**
9. **Document findings in QA&I database.**
10. **Note any deviations, if deviations are found call area superintendent and email all on the QA&I deviation list.**

Inspection Item: Boring

Pertains to:

Boring or trenchless installations.

Calculation of points:

One point for each inspection.

Inspection Checks:

- If coated pipe is installed by boring, driving, or other similar method, precautions shall be taken to minimize damage to the coating during installation. (OS 2525.2700 sec.3.6).
- Construction shall be conducted in such a manner as to minimize damage to shorelines, wetlands, recreational areas, adjacent structures, public rights-of-way, and fish and wildlife habitats. (OS 2525.2200 sec. 5.2).
- All utilities to be crossed shall be located and day lighted prior to drilling where practical. (OS 2525.2200 sec. 5.4).
- The minimum radius of curvature for steel carrier pipe shall be in accordance with Table 6-1. (OS 2525.2200 sec. 6.2.9).
- Measurements shall be taken a minimum of every 30 feet of drill pipe during the pilot hole drilling process, except as specified in Sections 6.4.1 and 6.4.2. (OS 2525.2200).
- A reamer shall be attached to the drill pipe and a swivel shall be attached between the reamer and pipeline pull head to ensure the hole remains open and no rotational torque is applied to the pipeline during pullback. (OS 2525.2200 sec. 9.1).
- Cathodic protection shall be installed in accordance with Operating Standard 2600.1300 to ensure continuity. (OS 2525.2200 sec. 9.4).
- The pullback section shall be supported so that it moves freely with minimal drag and the pipe wall/coating is protected from damage. (OS 2525.220 sec. 9.6).
- The leading end of all pullback sections shall be plugged to prevent entry of drilling fluid or other debris. (OS 2525.2200 sec. 9.7).
- Protective devices shall be used as appropriate to prevent pipeline damage from the edges of the pit at entry during pullback. (OS 2525.2200 sec. 9.8).
- The pullback forces in Tables 9-1 and 9-2 shall not be exceeded unless approved by the Manager Engineering. The Manager Engineering shall approve the maximum pullback force for pipe sizes, wall thicknesses, and grades that are not listed in Tables 9-1 or 9-2. (OS 2525.2200).

Inspection Steps:

1. **Proper staking completed before drilling (entry & exit points).**
2. **Drilling at proper angles for pipe to be installed**
3. **Proper back rimming preformed**
4. **Swivel head installed on bore rod before pull back.**
5. **All welds X-rayed prior to pull back.**
6. **Pipe tested per GOS requirements.**
7. **Shrink sleeved installed on steel wrap pipe, 5’ back from pull head.**
8. **PE pipe to have weak link installed.**
9. **Steel wrap pipe to be jeeped as pipe in being pulled back.**
10. **Pipe coating to be checked and has acceptable current, performed by Corrosion Control.**
11. **Document findings in QA&I database.**
12. **Note any deviations, if deviations are found call area superintendent and email all on the QA&I deviation list.**

Inspection Item: Guard Post

This inspection item can be found in the Site Audit portion of the manual under the heading:

Exposed Facility Protected

ATTACHMENT B to PSE's Response to PUBLIC COUNSEL Data Request No. 028.

PUGET SOUND ENERGY

QUALITY MANAGEMENT

QM INSPECTION MANUAL

Natural Gas Facility Installation
Low, Intermediate, and High Pressure

March 2015

PUGET SOUND ENERGY

Table of Contents

Gas QM Process Overview

Site Audits are random inspections performed on jobs selected from the daily crew assignment sheets by the Service Providers performing gas construction work. Many jobs are available for inspection only during the window of time between pipe installation and backfill. The Site Audit represents a “snapshot” inspection of work components performed on a job rather than an inspection of an entire job.

The primary purpose of this Site Audit Inspector’s Manual is as a job aid for those conducting site audit inspections and to promote consistency among the Inspectors. It contains a list of different inspection items related to gas installation tasks. This manual describes how inspection points are to be calculated for each item inspected. It also breaks down each inspection item into a list of primary inspection checks.

The inspection checks listed in this manual typically have three points in common.

a. Are required by PSE, which may be beyond State and Federal requirements.

b. Are written in PSE Operating Standards, Gas Field Procedures or a supplemental manual.

c. Have inspection criteria that are objective rather than subjective and in which the individual conducting the inspection can observe or in some way verify the work was performed satisfactorily.

Since each inspection check contains a reference, it can also be used as a guide to applicable standards and procedures. Some items are more involved than can be covered in this manual, so in these instances the user should review the Operating Standards or Procedures Manual for the requirements and more detailed information.

When conducting a site audit inspection the results are entered into the QM inspection database. Each inspection item checked is marked as either satisfactory or unsatisfactory. Upon completing an inspection the results are discussed with the crew foreman. Normally any problems identified during the inspection should be corrected at that time.

When a problem is identified and no crew is on site, prompt notification is necessary because some corrections can become increasingly difficult to make as time goes by and the dirt work progresses.
In those instances the contractor is promptly contacted by phone and sent an email with the Site Audit Report information.

Likewise, after a problem is corrected, prompt notification is necessary to allow the inspector the opportunity to verify the correction before the site is bulldozed, landscaped, etc.
When initially contacted by a QA inspector the contractor should give an estimate of when the correction can be made. In some instances a QA inspector may need to be on site during the correction.

Once a problem has been corrected the contractor should promptly contact the inspector. Also they must return a copy of the Site Audit Report (or send a reply email referencing the site audit) that gives the following details about each correction made:

1. The date of the correction.
2. The name of the person who made the correction (legible).
3. A detailed description of how the problem was corrected (legible).

The correction status of a deviation remains "Uncorrected" until the information is received/verified.

Inspection results are then compiled into a monthly report to track the contractor's performance.

Deviation Verification Process

Not all deviations share the same weight; therefore requirements for verification may vary. Quality Management (QM) should take into account the number of deviations on a job and consider the foreman's performance (error) rate. In the event specific deviations are found where QM determines there is a need to be on site when the repairs are being made; the inspector should send the service provider's superintendent an email requesting a notification with the date and time the repair is scheduled to be made.

Gas: Deviations recommended for verification include, but are not limited to:

Any underground depth, clearance or coating issues

- Leaks
- Paint
- MSA clearance/ venting
- Restoration
- Safety

Electric: Deviations recommended for verification include, but are not limited to:

- Phasing
- Grounds and Neutrals

- Clearances / Code violations
- Negative correction pattern established
- Corrected by unknown person / No correction history established
- Safety

Inspection Guidelines

- **At the beginning of each "Crew on Site" audit, locate the person in charge of the job so they are** aware an inspector is on site.

- Inform the person in charge in advance of plans to inspect items contained in or on crew vehicles. Do ***not*** enter any vehicle or open any vehicle doors even if permitted to do so by the person in charge. Preferably at a time when it is least disruptive to the work in progress, a crew person should bring out all of the items requested for inspection. Request permission to access roof pipe racks before performing pipe inspections.

- When the crew is on site, the person in charge **must be informed of a deviation before the inspector leaves the site. If the person in charge wants to see the report, you may show him/her the report on your computer.**

- Details about an inspection deviation should be written on the "Remarks" line for the item inspected. Remarks should include a description of the problem along with the proximity of the deviation and its severity. Clearance deviations should always include the measurements. Also note the Operating Standard or Procedure reference in the remarks.

- When practical, pictures of clearance problems should also include a tape measure in the picture for reference.

- There may be some deviations (such as a single large rock in the initial backfill) where it makes sense for the inspector to make the correction while on site. In situations like this the inspector should contact the crew's supervisor to verify that there are not any objections to the inspector making the correction. Depending on the deviation, a before and after picture should be taken. The pictures should be included with the Site Audit Report.

- The Site Audit Report should still indicate an "Unsatisfactory" condition with "Action Required".
- The "Correction Date" must be entered along with a note in the "Remarks" section indicating that the inspector corrected the deviation.

- When performing QC Inspections and there is a deviation on an item that the QC Inspector recorded, remember to give a "Satisfactory" whether correction is complete or not and report your findings in the comment section.

- When a deviation occurs on an audit do not add any extra information on the email about the deviation.

- When the crew does an exceptional job, a complement can be left in the comment section on the front page of the report.

- When arriving on post inspect, try to park your company vehicle in an area where the customer can see your vehicle.

- Approach the home wearing your PPE and your employee badge.

- Attempt to make contact with the customer and explain why and what you'll be doing, also ask if they were satisfied with the results of having their electric or gas installation. If you find problems with the installation explain to the customer that someone will be returning to correct them.

Options you have when a customer asks about PSE rebates?

Hand them pamphlet form # 4862 “Re-Energize with Rebates for Your Home”

- Give then the phone number to a PSE Energy Advisor at 1-800-562-1482
- You can direct them to the Company website at PSE.COM/REBATES
- You can use your computer to log into the PSE website and show them where to look

Photo Attachment Guideline Recommendations:

- When sending emails the sum of all attachments should be under 2,500 KB
- Instead of attaching photos to an email, consider providing a link to the folder where the photos are stored.
- If the attachments are only a sample of the total photos on file an option is to include a statement in the email such as: “Additional photos are available upon request”
- If more than one email is used to send multiple photos, keep the subject line text the same except include at the end of the subject line statements such as: “Email 1 of 2” and “Email 2 of 2”
- Do not sent duplicate, blurred or low quality photos

Recommendation for drive storage:

- Do not store duplicate, blurred or low quality photos

Removing Deviations:

- If an audit report is issued with one or more deviations and one (or more) of the deviations is subsequently removed based upon discussions with Standards, Contract Management and/or QMI supervisor, the audit record in the database is to be revised as follows:
- In the Remarks section for the line item that the deviation will be removed from, the inspector adds to the existing remarks as follows:
- "Revised audit [MM-DD-YY] to remove deviation [state reason]".
- The date (in MM-DD-YY format) and the reason are variables that need to be filled in by the inspector.
- This verbiage goes ahead of any previous text in the Remarks section so that it is seen/read first.
- The reason needs to state specifically what made it not a deviation (i.e. "because Standards clarified this was not a remote meter"; or "because condition was existing and SP not responsible to revise"). It doesn't have to be long but this is our chance to say specifically why the deviation was removed.
- The Subject line of the e-mail that accompanies the revised audit report will be changed by the Inspector by adding the word "REVISED" ahead of the auto generated verbiage.

Job Responsibilities on a High Pressure job (Expanding on Swim Lanes)

Departments involved in a HP gas project:

- Construction Management (CM)
- Engineering
- Project Manager (PM)
- Quality Management (QM)
- Contractor Project Manager
- Service Provider Crew (IFS)
- PSE Pressure Control

HP projects come in a variety of sizes, complexity, and involvement from the Departments listed above. If a job is routed through Major Projects the Construction Manager acts as the liaison between the Crew, PM and the municipality in which the work is taking place.

There is no structured procedure for whom does what on a HP job, regardless if it involves a CM. HP jobs that are a "direct handoff" to the service provider (IFS) generally do not involve a CM. Once construction begins, more often than not, the QA Inspector is the only constant PSE presence at HP work locations; the PM is typically not on site. The times in which the PM's are onsite are usually structured around a meeting involving the municipality to convey updates on the project. This typically leaves the QA Inspector as the PSE liaison for any questions/changes that arise during construction, and can shift their primary responsibility away from inspection.

Department responsibilities for HP gas projects:

- Construction Manager: manage project from start to completion, including scope, schedule and budget.
- Project manager: overall project responsibility.
- Engineering: technical resource, design change approvals upon request if applicable
- Quality Management: assure adherence to GOS and GFP, and industry best practices
- Contractor Project Manager: overall contractor crew liaison
- Foreman/Crew: installation of the designed project to PSE specifications
- PSE Pressure Control: administer pressure test/purging procedure (engineered job specific), pressure monitoring

Report for Welding within 18" of Rubber Stopper

When called to a job site to determine if the only solution to complete a job is to weld within 18" of a rubber stopper as stated in GOS 2575.2000 - Preventing Accidental Ignition:

3.4.2 When using mechanical line stoppers to isolate a section of pipe, welding work shall not be performed within 18 inches of a rubber stopper, unless approved by a Quality Assurance Inspector.

QA Inspector:

Date:

Job Number:

Foreman of Crew:

Name of Welder:

Address:

Location of weld:

Type of Fitting:

Size of outlet piping:

Distance from rubber stopper to weld:

Approval required:

Heat Shield required:

Other Conditions/Requirements:

Safety

The Inspector must be aware of events that might impact safety on the job, and of the working conditions under which to stop work, such as:

- Imminent danger
- To the public, service provider, or PSE personnel
- To PSE facilities or its systems

- **Unsafe conditions**
  - The Inspector must notify the Quality Control Manager or Superintendent and document the condition(s) and the outcome in the Site Audit Inspection Report. Ensure there is sufficient detail regarding the condition and then forward this report to the QM Supervisor. If an unsafe condition was rectified, the Inspector must also document the solution. If unsafe conditions continue, the Inspector shall notify PSE's *Manager QM* and *Manager Safety.*
  - Employees must report all unsafe conditions and practices to their supervisor, manager, or foreman.
  - Once reported, local management then takes appropriate corrective action.
  - Contact any member of the Safety Department for their recommendations for corrective action.
  - All employees have the right to stop work if an unsafe condition is present, so that the condition can be corrected.
- **Life-threatening accident**
  - The Inspector may stop work on the job site, dial 911 first, and then call dispatch. Also, contact the *Manager Safety.*
  - ***NOTE:*** Every PSE employee is responsible for their own safety.
  - QM conforms to the PSE Safety Department's PPE guidelines outlined in the "Yellow Book." (See also the Employee Safety and Health Program (Yellow Book).

Definitions

Satisfactory: Indicates that all of the Inspection Item's requirements (that were pertinent and available to audit) conformed to PSE Standards and Procedures. Since we often are only able to audit a small section or portion it does not mean QM is approving an inspection item or job.

Unsatisfactory: Indicates that one or more of the inspection item checks do not fully meet PSE requirements/specifications. A correction may or may not be required depending on the item.

Examples of "Unsatisfactory" with no "Correction Required" could be:

- Past due instrument calibration (only for instruments not being used)
- Gas Field Procedure manual not on site
- Materials such as pipe improperly handled (provided no damage occurred)
- Qualification Card not on site (provided person's qualifications are still valid)

Action Required: Indicates that an Unsatisfactory inspection item resulted in an unsatisfactory installation that needs to be fixed. NOTE: A variance granted by the Standards Department is also acceptable.

Action Required enables the database to track the problem until it is fixed.

Examples of "Unsatisfactory" with "Action Required" could be:

- Bad fuse on pipe at the edge of the trench intended for installation
- Buried pipe that has been damaged
- Holidays left in pipe coating

Database "Item Applicability" column *(this information only displays in the database)*: All 27 Inspection Items must be assigned one of these four options on every Site Audit.

Not Applicable: Means the inspection item does not apply to the job at any time during construction.

Example: "Welding" would be "N/A" on a new PE service in a PE joint trench plat.

Yes-Inspected: Means yes it is applicable and it was inspected. This is the required option when you have a number in either the Satisfactory or Unsatisfactory column.

Yes-Not Available: Means yes it is applicable but the Inspector is not able inspect it at the time.

Example: A 5/8" PE conversion service coming off a STW main. "Welding" would be "Not Available" if the weld punch-it tee was welded on the main and backfilled prior to the Inspector arriving on site. Another example could be doing a post-inspection of a 5/8" PE NCC Service. The "Initial Backfill" item would be "Not Available" (unless the Inspector decided to pot-hole the service).

Yes-Not Inspected: Means yes it is applicable and was also available, but the Inspector decided not to check it. When this option is selected there should be a note in the Remarks explaining why the item was skipped.

Example: The Inspector audits a crew twice on the same day. Since points for "Manuals on Site" can only be given once a day the Inspector would choose "Yes-Not Inspected" for the item and note in the Remarks column that the manuals were checked on a previous job that day.

Deviation Classifications *(this information only displays in the database)*

PSE Gas Quality Management Directory

	Mail Stop	Cell Phone	Office Phone
Manager QM:			
Kaaren Daugherty	EST-07W	425-766-2409	425-462-3748
Supervisor			
Jerry Halsen	EOB-01	425-471-5297	425-356-7547
Administrative Specialist:			
Kathleen Maddox	EST-07W	-- -- --	425-462-3831
Gas QA Inspectors:			
Jimmy Allen	SKP-SVC	425-429-0623	360-475-7014
Carl Baggenstos	EOB-01	425-471-5295	425-356-7502
Jeff Horton	TAC-01	253-548-5589	425-356-7547
Kirk Goodrich	EOB-01	425-231-3941	425-356-7520
Greg Haugen	EOB-01	425-754-5715	425-356-7512
Steve Mellinger	FAC-SVC	206-255-4824	425-449-7543
Keith Miller	PUY-SVC	425-471-5301	253-845-6204

InfraSource Directory

Robert Veitch	VP Construction Operations	(253) 606-4299
Lenny Woods	Director QA & Compliance	(425) 516-4747
Dave Wharton	Manager Quality Control	(206) 380-3451
Alex Bartells	Safety Director	(253) 370-8795
Jon Henderson	Superintendent	(360) 490-7167
Mike Beuslinch	Area Manager	(253) 606-4644
Dean Roberts	Superintendent	(425) 864-9698
Gary Barnes	QC Inspector	(425) 736-2771
Kevin Kohler	QC Inspector	(206) 940-8984
Jim Murray	General Foreman	(253) 720-1597
John Frederick	Superintendent	(425) 516-4928
Mike Blood	General Foreman	(425) 864-6154
Mark Bowling	General Foreman	(425) 864-9504
Jody Vorpahl	General Foreman	(253) 320-1828
Don Smith	Superintendent	(360) 490-7598
Tom Miller	Superintendent	(253) 606-2239
Gunner Anderson	Superintendent	(206) 375-3574
Kyle Darby	Area Manager	(425)-766-0229
Kirk Stanley	Area Manager	(616)-550-4012
Dean Latimer	Area Manager	(253)-350-6687

Site Audit Email List for InfraSource Crews

All reports with no deviations go to QA/QC Inspections mailbox.

Reports with deviations go to area superintendent, QA/QC Inspections mailbox, Kaaren Daugherty, John Dickson, Cheryl McGrath, Pam Parrish, Shamish Patel, Jerry Halsen and Dave Wharton.

Olympia
Tom Miller

Seattle
Gunner Anderson

Pierce
Don Smith

Snohomish County
Dean Roberts

Redmond
John Frederick

South King & Kittitas
Jon Henderson

Pipeline All Counties
Mitch Bogrand

Mitch Bogrand	(253) 606-6608
Todd Wiggins	(253) 606-5399
Cricket Shires	(253) 606-4301

Service Provider Locations

InfraSource:

Kent
8001 S 212th St
Kent, WA 98032

Lakewood
11705 83rd Ave SW
Lakewood, WA 98498

NOB
13330 Stone Ave N
Seattle, WA 98133

Olympia
2711 Pacific Ave SE
Olympia, WA 98501

Puyallup
5807 Milwaukee Ave E
Puyallup, WA 98372

Redmond
18150 Redmond Way
Redmond, WA 98052

Snohomish
3625 Bickford Ave
Snohomish, WA 98290

Sumner Office
14103 8th St E
Sumner, WA 98390

Inspection Item: Qualification Card

Pertains to:

Weld, Fusion, Mechanical Joints, Hot Tap Data Card. This pertains to all individuals who have qualification cards whether they are performing qualified work or not.

Calculation of points:

Individuals on the job site performing tasks requiring a Qualification Data Card can be checked. One point maximum for each person. The Inspector should not count points for the same person more than once in a single day.

Inspection Checks:

- Plastic joiners must carry Qualification Data Cards when joining PE pipe on PSE facilities (OS 2700.1600 sec 3.2). This pertains to personnel joining polyethylene pipe, tubing, and fittings by mechanical fittings and heat fusion methods (OS 2700.1600 sec 1).
- Welders must carry a Qualification Data Card when welding on PSE facilities (OS 2700.1100 sec 3.2).
- All Company and Contract Personnel performing hot taps shall have in their possession a valid
- Qualification Data Card (Form 1943) or show proof that they are operator qualified to perform this work.
- If during a 12 month period, a plastic joiner has performed at least one production joint for each applicable joining procedure under a joining classification, the requalification test interval for that joining classification may be at a frequency of at least once annually, not to exceed 15 months (OS 2700.1600 sec 6.1.2.1).
- Notes and Best Practices: See Operating Standard 2425.1075 section 5 for definitions of compliance time frames.

Inspection Steps:

1. **Some workers keep their cards in their vehicles. Request the card from the worker, preferably when it is least disruptive to the work in progress.**

2. **If worker fails to have their card on site it should be counted as unsatisfactory but not requiring correction provided the person's qualifications are current. Verify with Tony Smith (206-571-1132) that the records show the worker's qualifications are current. When practical try to perform another Site Audit in the next few days to verify the person now has their Qualification Card on site.**

3. **If worker is or has performed qualified work but does not have a current Qualification Card contact QM Supervisor ASAP to determine appropriate course of action.**

4. **Notify Area Superintendent by phone if a deviation is found.**

5. **Document findings in QM database.**

6. **Email report to all on the QM deviation list**

Inspection Item: Manuals on Site

Pertains to:

Having a current copy of the Gas Operating Standards and Gas Field Procedures available at the job site. Also applies to personnel not working under the direct supervision of the job foreman such as a laborer watching JT sanding.

Calculation of points:

One point maximum for having both manuals (Gas Operating Standards and Gas Field Procedures) on the job site. The Inspector should not count points for the same manuals more than once in a single day.

Inspection Checks:

- Operating Standards covering the work to be performed must be available at locations, including worksites, where activities described in are conducted (OS 2425.1075 sec 3.3).
- Field Procedures covering the work to be performed must be available at locations, including worksites, where activities described in are conducted (OS 2425.1075 sec 3.3).
- Interim Operating Standards and Field Procedures may be published at any time, as required (OS 2425.1000 (sec 4.1.1.1).
- Perform periodic audits of field and office personnel to verify that manuals have been updated in accordance with (OS 2425.1000).
- The manual owner is responsible for keeping their book up to date with the current version of each standard or procedure. (OS 2425.1075 sec 3.5.1.)

Inspection Steps:

1. **Verify manuals are the latest versions and contain any updates.**
2. **Request manuals from person in charge preferably when it is least disruptive to the work in progress.**
3. **Check contractor's computer for GOS and GFP.**
4. **If worker fails to have current manuals on site it should be counted as unsatisfactory but not requiring correction.**
5. **When practical try to perform another Site Audit in the next few days to verify the person now has their manuals on site.**
6. **Notify Area Superintendent by phone if a deviation is found.**
7. **Document findings in QM database.**
8. **Email report to all on the QM deviation list.**

Inspection Item: Calibration Verification

Pertains to:

Verifying that instruments are receiving accuracy checks. This inspection pertains to any instrument that will be used at some time during the life of the job. See OS 2450.1600 for instruments not listed here.

Calculation of points:

One point maximum for all instruments requiring an accuracy check (that are applicable to the job). The Inspector should not count points for the same crew's instruments more than once in a single day.

Inspection Checks:

- Accuracy checks and calibration of instruments shall be performed according to the schedules listed in the Operating Standards. All instruments shall be checked by trained personnel, in accordance with published manufacturers' procedures (OS 2450.1600 sec 3.5 & 3.7).
- Prior to first use, each new instrument shall have an accuracy check performed upon it (OS 2450.1600 sec 3.9).
- Instruments used in Company operations are sensitive and shall be handled with care. All instruments should be protected from moisture, temperature changes, and jarring where possible. When not in use, instruments shall be stored in a clean, dry place (OS 2450.1600 sec 3.10.1 & 3.10.2).
- All recorded calibration dates, including due dates on accuracy check stickers, shall be written using an mm/did/my format (OS 2450.1600 sec 3.11).
- MSA 60 (Combustible Gas Indicator) accuracy checked at least monthly not exceeding 45 days between checks (OS 2450.1600 table 5-1).
- Each Instrument tagged with a sticker that designates the next accuracy check due date (OS 2450.1600 sec 5.4.1).
- Pocket Pot or Digital Multi Meter accuracy checked at least once per year not exceeding 15 months between checks (OS 2450.1600) (Table 7-1).
- Pocket Pot Digital Multi Meter tagged with a sticker that designates the next accuracy check due date (OS 2450.1600 sec 7.3.1).
- Digital Thermometer (Pyrometer) accuracy
- Checked twice per year not exceeding 7 ½
- Months between checks (OS 2450.1600 table 9-1).
- Digital Thermometer (Pyrometer) tagged with a sticker that designates the next accuracy check due date (OS 2450.1600 sec 9.3.1).
- 0-160 Analog Pressure Gauge (spring gauge) accuracy checked at least 4 times a year not exceeding 4 months between checks (OS 2450.1600 table 8-1).
- 0-160 Analog Pressure Gauge (spring gauge) (that do not have serial numbers), have ID numbers engraved on the back of the gauge as specified in the Standards (OS 2450.1600 sec 8.8, table 8-3).
- 0-160 Analog Pressure Gauge (spring gauge) tagged with a sticker that designates the next accuracy check due date (OS 2450.1600 sec 8.6).
- Portable Pressure Recorder (chart recorder) accuracy checked twice per year not exceeding 7-1/2 months between checks (OS 2450.1600 table 8-1).
- Portable Pressure Recorder (chart recorder) tagged with a sticker that designates the next accuracy check due date (OS 2450.1600 table 8.1).

Inspection Steps:

1. **Inspect calibrated instruments that will be used for the job that is being inspected when it is convenient for the crew.**
2. **Have the crew member get the instruments for you; don't go into their truck to look for instruments.**
3. **Check all dates and write them down so they can be entered in QM database.**
4. **Verify Spring Gauges have clear lens protecting needle and that the gauge reads "0" when not on pressure.**
5. **Recommend crews move outdated gauges being returned for recheck away from stored stock of approved gauges.**
6. **Instruments without an accuracy check sticker, or a sticker that has non-legible re-check dates or dates past the allowable re-check due date should be counted as unsatisfactory for each piece of equipment.**
7. **No correction is required provided past due equipment is not being used. If crew is or has performed work with unchecked instruments contact QM Manager.**
8. **Notify Area Superintendent by phone if a deviation is found.**
9. **Document findings in QM database.**
10. **Email report to all on the QM deviation list.**

Inspection Item: Materials Handling, Storage and Transportation

Pertains to:

Pertains to how pipe and meters are transported in crew trucks and handled in the field.

Calculation of points:

One point maximum for handling, storage, or transportation of all pipe and meters.

Inspection Checks:

- Verify diaphragm meters are kept upright (OS 2550.2000 sec 9.1.1).
- Verify stored meters have inlet and outlet capped (OS 2550.2000 sec 9.1.2).
- Do not set a diaphragm meter that has been turned upside down (OS 2550.2000 sec 9.1.3).
- Do not set a meter that has been dropped (OS 2550.2000 sec 9.1.4).
- Do not set a meter that has been damaged (OS 2550.2000 sec 9.1.5).
- Meters turned in “as found” in the field (OS 2550.2000 sec 9.1.5.1).
- Reported on the Meter Remove Tag when damage occurred to a meter (OS 2550.2000 sec 9.1.5.2).
- Used meters handled with care (OS 2550.2000 sec 9.1.6).
- PE pipe exposure shall not exceed two years from the date of manufacture, regardless of the method of storage, even if stored inside (OS 2450.1500 sec 3.3).
- Straight and coiled stored PE pipe shall be stacked as described in GOS (2450.1500 sec 4).
- Verify proper handling of PE pipe (OS 2450.1500 sec 5)
- PE pipe not dragged across hard surfaces (such as concrete or asphalt) or crushed rock (OS 2450.1500 sec 5.2.1.1).
- Plastic end caps, tape, or other covering shall be installed and maintained on all PE pipe prior to fusion (OS 2450.1500 sec 3.2).
- All PE pipe shall be stored to keep the pipe joints straight, parallel, and without a downward center bow (OS 2450.1500 sec 4.1).
- No PE pipe (straight or coiled) shall ever be stored directly on the ground (OS 2450.1500 sec 4.1.2).
- When it is necessary to place PE pipe in a lane of traffic momentarily, the pipe shall be attended at all times, a flagger should be present, and vehicles shall not be allowed to drive directly over the pipe (OS 2450.1500 sec 5.2.5).
- PE or coated steel pipe laid along a ditch shall be supported off the ground protecting the pipe surface, unless there is no possibility of damage and approval is obtained from a PSE representative (OS 2450.1500 sec 4.3.1, OS 2450.1400)
- Storage of steel pipe shall be stacked as described in (OS 2450.1400 sec 4 table 4-1 & 4-2)
- All steel pipe shall be stored at least 6 inches above the ground (OS 2450.1400 sec 3.2.1).
- Storage of steel pipe shall be stacked as described in (OS 2450.1400 sec 4 table 4-1 & 4-2)
- Steel pipe shall be handled (lifting, moving, unloading) as described in (OS 2450.1400 sec 5).

Inspection Steps:

1. **Request permission to inspect the meters and pipe stored inside and on a vehicle from person in charge.**
2. **If the deviation is found on the truck (not yet installed) it should be counted as unsatisfactory but not marked correction required.**
3. **If the deviation is installed it should be counted as unsatisfactory with correction required.**
4. **When possible in either instance the crew should correct the problem at the time of audit.**
5. **Coated and wrapped steel pipe should not exceed two years of exposed yard storage.**
6. **Coated or wrapped pipe (being stored) should be covered with a tarp to protect from UV exposure.**

Inspection Item: Service Prerequisites and Route Requirements

Pertains to:

After a service is installed, this item evaluates the route. It does not matter who provided the trench. The installation crew is responsible to ensure the service route is consistent with PSE standards and that all prerequisites have been met. This item also pertains to twin services and JT service stubs. Above ground portion of service at MSA is checked under the Meter Set Assembly inspection item.

Calculation of points:

One point maximum for each service route / requirement. Stub markers points are calculated using the 100' rule. One point for all stubs along 100 lineal feet of trench with each additional 100' section inspected counting as an additional point. Note: If the meter is in an acceptable location but there is an unapproved back yard service mark the point under this inspection item. If the meter is also in the back yard mark the point under the Meter Set Assembly inspection item (one point total).

Inspection Checks:

- When providing service to new construction single-family residential construction, before the service and meter are installed: final grade must be established and the fuel line must be in place and stubbed out with approved permit (OS 2550.2000 sec 3.1).
- Joint trench service stubs provided for every lot (OS 2525.1500 sec 5.2).
- Joint trench service stubs marked with a Gas Stub marker which is properly supported by approved PVC pipe (OS 2525.1500 sec 5.2.3).
- The approved fusion or mechanical cap shall be taped horizontally to the stub marker support. (OS 2525.1500 sec 5.2.4 and Figure 5-2).
- Services shall not be installed over oil tanks, septic tanks, in septic drain fields or reserve areas, or under trees with deep roots waiver for deep roots W08-23R (OS 2550.1500 sec 4).
- Services shall not be located in conflict with
- Or under building footings, pier supports, carports, sheds, areaways, covered terraces and other construction features either existing or proposed. Services shall not be installed below the level of a footing if closer than 12 in. to the wall (OS 2550.1500 sec 4).
- Services shall not be installed across cul-de- sacs (OS 2550.1500 sec 4).
- Service shall only be installed when there is main adjacent to the property in the right-of- way or adjacent to the utility easement for the property (2550.1500 sec 4).
- Services shall be provided from the street from which the building is addressed, except when main is in alley, building is on corner lot or approved by Contract Mgmt. (OS 2550.1500 sec 4).
- Service shall not be installed through back yard except when main is in alley or approved by Contract Mgmt. (OS 2550.1500 sec 4).
- Twin service length not more than 100’ unless approved by Contractor Mgmt. (OS 2550.1500 sec 6.3).
- Twin service has main in front of the MSA location of both homes (OS 2500.1500 sec 6.5).
- Service shall not installed in place of main such as running a service parallel to the R/W beyond an existing main end on jobs where a main extension would be required (OS 2550.1500 sec 3.3).
- Service shall not be installed to a building until the building is framed (OS 2550.2000 sec 3.2).
- Mains and services shall not be installed under concrete slabs adjoining a manufactured/mobile home or RV foundation unless approved by Manager of Standards (OS 2525.3100 sec 4.2).
- Service sized as specified in Standards (OS 2550.1500).
- 1 1/8” PE service connected to steel mains with correct tee size as specified (OS 2550.1600).

- For new commercial and industrial services, the service shall be a minimum of 1-1/4 inches, except when 1-1/8-inch PE or 1-inch steel pipe is allowed in accordance with the service sizing tables in this Operating Standard. (OS 2550.1500 sec. 3.9)

Inspection Steps:

1. **Upon arrival, figure out how the service was installed by looking for asphalt patches, bore holes in the grass or other signs of disruption to property.**
2. **Confirm service route is not under property features such as sheds, carports, and oil tanks.**
3. **If digging up a service to check for depth of initial backfill, dig carefully so pipe is not damaged. Separate final fill from initial fill so sand may be re used or use new sand that you carry on your truck.**
4. **Measure the level of initial backfill as well as the total depth of service line.**
5. **Backfill with initial fill and final fill, compact and clean up area that was disturbed.**
6. **If crew is on site during inspection, confirm proper pipe size, EFV, wire installation, and tie in location and service route.**
7. **Document findings in QM database.**
8. **Note any deviations, if deviations are found, email report to all on the QM deviation list.**

Inspection Item: Meter Set Assembly

Pertains to:

MSA and the above ground portion of the riser. Also pertains to MSA locations and requirements including remote locations. Regulator and relief vent piping clearances from building features. Steel venting pipe installed from the regulator to a location that meets the clearance requirements for relief vents.

Calculation of points:

One point maximum for each MSA installation/requirements. Note: If the meter is in an acceptable location but there is an unapproved back yard service mark the point under Service Prerequisites and Route Requirements. If the meter is also in the back yard mark the point under the MSA inspection item (one point total).

Inspection Checks:

- Regulator vent clearances met (OS 2550.1800 sections 5-10).
- Service or riser replacements or altered MSAs brought up to Standards (OS 2575.2300 sec 3).
- Test and tied services meet requirements (OS 2525.2100 sec 4).
- For service to new construction single family residential customer the tie in to the customer's fuel line shall be done by PSE or PSE's Svc Provider unless approved by Contractor Mgmt. (2550.2000 sec 8.2).
- When an AMR meter set is installed, the installer shall open and plug in the battery to energize the unit (GFP 4650.1400 step 2 pg. 3 of 4. OS 2550.2000 sec 7.8).
- When a 250 or 425 meter is removed disconnect AMR battery before leaving. (GFP 4650.1400)
- When a service is replaced a meter not in readily accessible or approved locations is moved to an approved location (OS 2575.2300 sec 6.2).
- Meter and regulator installed so as to minimize stresses upon the connecting piping and meter (OS 2550.1000 sec 3.5).
- Meter not in the back of the house unless residence is served from an alley or approved by Contractor Mgmt. (OS 2550.1800 sec 3.13).
- Riser and meter valve shall have immediate access and operation of the grease fitting
- and operating head in an emergency (OS 2550.2000 sec 7.4.2, GFP 4575.1060 pg. 2 step 5).
- MSA shut-off valve shall be installed a minimum of 8 inches above final grade and the meter shall be installed a minimum of 6 inches above final grade (OS 2550.2000 sec 7.4).
- The service riser shall be installed with a minimum of 6 inches (250 & 425 meters) and 8 inches (1000 meters) clearance from the building wall and in no case shall any part of the MSA be closer than 2 inches from the finished building wall (OS 2550.2000 sec 7.1 and 7.2).
- MSA in snow country meet the specified requirements (OS 2550.2000 sec 7.5).
- All above ground portions of the service shall be steel (OS 2550.1500 sec 4.6).
- Propane customer fuel line stub out location shall comply with the meter location requirements of OS 2550.1800 (OS 2675.1000 sec 4.4.1).
- Services not placed into service upon completion shall be left off, locked, and tagged, as specified in the Standards (OS 2550.2000 sec 12 & OS 2575. 2200 sec 3).
- On service replacements the GFR and the Service Provider shall re plumb the customer's fuel line with a meter outlet valve (A-9 valve) for 250 meters or with a bypass bar for 425 or 1000 meters (OS 2550.2000 sec 12.4.1).
- PSE or PSE's service provider shall test the service regulator in accordance with GFP 4550.1020 (OS 2550.2000 sec 12.2.1).
- Service provider tested the service regulator on new construction and svc replacements (OS 2550.2000 sec 12).

- PSE tested the service regulator on conversion services (OS 2550.2000 sec 12.3.2).
- A425, A630, and A1000 meters shall be temporarily supported during installation with approved support structures. Approved structures for temporary support include the following coded items: concrete pier blocks, meter pads, concrete bricks, or adjustable gas meter stands. (OS 2550.2000)
- Non-coded non-combustible support structures that are equivalent to those mentioned in Section 7.6 may also be used to temporarily support A425, A630, and A1000 meters during Installation (OS 2550.2000)
- Meter manifolds installed with 1" Mobius fittings on pounds delivery only and or A-9 valve on inches WC or pounds delivery (OS 2550.2000 table 12-1).
- MSA (working) clearance zone obtained from PSE electric meter (OS 2550.1800 sec 6.1 and figure 6-1 and 6-2). Note this pertains to a working clearance not regulator vent clearance. If both the MSA clearance and regulator vent fail to meet standards document only once under "Regulator Relief Vent Clearance" inspection item.
- The MSA shall be installed plumb in order to minimize anticipated stress on the connected piping and the meter. (OS 2550.2000 sec 7.4.6)
- A union shall be installed just downstream of the relief vent if the vent piping will be greater than 3 feet (OS 2550.1800 sec 10.1.1)
- The MSA location shall comply with the requirements for clearances between the service regulator relief vent and building features as required in the Standards (OS 2550.1800 sec 5).
- The service regulator relief vent terminates at least 12 inches above final grade (OS 2550.1800 sec 5.5).
- The service regulator shall be installed with the relief vent pointed downward to prevent the accumulation of water, ice, or snow (OS 2550.1800 sec 5.4).
- Clearances for operable windows shall be determined by measuring from the closest window opening to the relief vent termination (OS 2550.1800 sec 5.6.1).
- Any window manufactured to open is considered open able regardless if it is temporarily painted or screwed shut. (OS 2550.1800 sec 5.6.1.1).
- Relief vent clearances met (OS 2550.1800 sec 5, table 5-1).
- If it is not possible to place the regulator relief vent in a location outside of the required clearance zone, then steel vent piping shall be installed so gas can be discharged into the atmosphere without undue hazard. Vent piping should be used as a last resort (OS 2550.1800 sec 5.2).
- Steel pipe is the only acceptable material to use for vent piping. (OS 2550.1800 sec 5).
- Never down size the piping from the vent opening. Street elbows are not to be used in vent piping (OS 2550.1800 sec 10.3).
- Install one size pipe for the entire run. If a pipe size is larger than the vent opening needed, expand up to that pipe size immediately outside the vent opening (OS 2550.1800 sec 11.3).
- Piping shall be anchored to prevent undue strains on connected equipment and shall not be supported by other piping (OS 2550.1800 sec 10.4 and 2525.2400 sec 4).
- Vent piping sized per standards (OS 2550.1800 sec 11. OS 2525.2400 sec 4).
- Relief and breather vents shall be designed to prevent entry of weather, insects, or other foreign materials. The vent lines shall not be tied together, but run separately and point downward (OS 2550.1900 sec 6.5).
- The vent piping shall be installed to prevent the accumulation of water, ice, or snow. For vent piping on service regulators, a full opening vent cap with an insect screen shall be installed and the screened opening shall point in a downward direction (OS 2550.1800 sec 10.5.1).
- The vent piping shall be installed to prevent the accumulation of water, ice, or snow. For vent piping on an external relief valve, a weather cap shall be installed (OS 2550.1800 sec 10.5.2).
- Service regulators located in vaults and inside buildings shall be vented to the outside atmosphere

(OS 2550.1900 sec 6).

- Each regulator that might release gas in its operation is vented to outside atmosphere (OS 2550.1000 sec 3).
- Fuel line touching MSA piping or meter, Insulating devices shall be installed (OS 2600.1400 sec 4.1) Separation between MSA & fuel line shall be 1" or more. (OS 2550.2000 sec 7.3
- Meter must be leveled for accurate reading (GD & CS 4060.1100 pg.1).

Notes and Best Practices: Clearances do not apply to building features around outside corners on the structure when the service regulator relief vent is located at least 12 inches from the corner. When a regulator vent is less than 12 inches from the corner, building features on adjacent walls are then also applicable when taking measurements (OS 2550.1800 figure 9.1 thru 9.3).

Clearances do apply from features on inside corner adjacent walls. In these instances, measure line of sight from the relief vent to the building feature.

MSA (working) clearance zone obtained from PSE electric meter (OS 2550.1800 sec 6.1 and figure 6-1 and 6-2) are note checked under this inspection item but rather under inspection item "Meter Set Assembly". If both the regulator vent and MSA clearance fail to meet standards, document only once under this (Regulator Relief Vent Clearance) inspection item.

Inspection Steps:

1. **Check and measure regulator vent clearances.**
2. **Measure MSA clearances from building features.**
3. **Check that battery is plugged in to AMR meter.**
4. **EFV tag installed and placed correctly when applicable.**
5. **Meter is locked correctly.**
6. **Warning tag is correctly placed and job number is written on it, when applicable.**
7. **Fuel line is tied in when applicable, and has 1" of clearance from the MSA.**
8. **Wrench marks are sanded or filed smooth and paint looks good.**
9. **A-9 valve is installed.**
10. **MSA is installed plumb and level.**
11. **MSA supported when not tied in to fuel line.**
12. **If bricks were used as a means of "temporary support" and the fuel line is tied in, remove bricks and return to PSE stores**
13. **If crew is on site during inspection, watch fitter test regulator per GOS and GFP.**
14. **Document findings in QM database.**
15. **Note any deviations, if deviations are found, call area superintendent and email report to all on the QM deviation list.**

Inspection Item: Locate Wire

Pertains to:

Proper installation of locate (tracer) wire. Anode installations for locate wire are audited under this inspection item and not the CP Requirements inspection item.

Calculation of points:

Locate Wire points are calculated using the 100' rule. One point for all wire along 100 lineal feet of trench. Each additional 100' section inspected counts as an additional point.

Inspection Checks:

- Tracer wire installed at pipe depth and laying near the PE pipe (OS 2525.2300 sec 3.2 and6.1).
- Tracer wire not spiral wrapped around the PE pipe (OS 2525.2300 sec 3.2).
- The tracer wire shall terminate above ground, and be securely attached to the neck of the riser (OS 2525.2300 sec 7.1).
- Tracer wire joined with approved splice kit (OS 2525.2300 sec 3.6, GFP 4575.1015).
- When a PE main is extended from a steel main, the tracer wire shall be brought to the surface in a wire box (OS 2525.2300 sec 6.2). Note: see CP Requirements for inspection of the test lead.
- To facilitate locating, a physical connection to the tracer wire shall be available approximately every 500 ft. along the main either at a service riser or brought up in a wire box (OS 2525.2300 sec 5.2.1.1).
- In joint trench construction, the locating wire shall be run up with each service stub marker and taped to the conduit supporting the stub marker (OS 2525.1500 sec 5.2.2 and 5.2.3).
- Tracer wire shall be cathodically protected (with proper PSP read -0.5 V) as required (OS 2600.2000 sec 4.4.3.2).Or has a 1# anode installed.
- PE service extending from wrapped steel or bare steel mains, the tracer wire shall be spirally wrapped around the service tee. Do not wrap tracer wire around PE pipe. (OS 2525.2300 sec 7.2) A 1 pound anode shall be installed (OS 2600.2000 sec 4.4.2).
- For every 1000 feet of locate wire, a one pound anode shall be installed (OS 2600.2000 sec 4.4.1).
- Anode shall be placed at or below pipe or tracer wire depth, and at least 6 inches away from the pipe (OS 2600.2000 sec 3.1).
- Ground strap for attaching the locate wire is installed as specified in the procedures (GFP 4575.1000).
- When attaching locate wire to metallic pipe, Cad weld is made prior to inserting PE pipe into Cad welded pipe (OS 2525.2300 sec 4.3).
- Approved method used of attaching tracer wire to steel casing (OS 2525.2300 sec 5).
- Wire spirally wrapped (nonconductive) only occurs as a last resort when casing is 4” or larger and has existing PE inserted (OS 2525.2300 sec 5.2.2.1). Note: can’t cad weld on inserted casing and ground straps are limited to 2” or less casing diameter.

Notes and Best Practices: Taping locate wire to PE pipe is permitted. Contact with pipe must be minimized but is not prohibited. (OS 2525.2300 sec 3.2)

New or repaired tracer wire shall be verified to have a PSP of less than -0.5V. If the tracer wire has a read of less than -0.5V no anode is required (OS 2600.2000 sec 4.4.3.2).

Inspection Steps:

1. **Confirm that tracer wire is present and connected to the riser and take a psp read.**
2. **If crew is on site, inspect proper wire connection and anode placement.**
3. **Check wire for spirally wrapping around the pipe.**
4. **Document findings in QM database.**
5. **Note any deviations, if deviations are found, call area superintendent and email report to all on the QM deviation list.**

Inspection Item: Painting/Coating Exposed Facility

Pertains to:

Coating requirements of all exposed metal surfaces on meter set assemblies and exposed facilities for the purpose of preventing atmospheric corrosion of gas carrying facilities. Inspection for new construction includes all pipe upstream of the outlet spud including the spud. New construction customer fuel line is not included in this inspection. Some fuel line painting maybe required on existing MSAs where corrosion is present. Painting guard post, valve box lids and CP test box lids are not audited under this inspection item. Facilities in vaults are considered exposed facility.

Calculation of points:

One point maximum for each meter set assembly inspected on a job. Multiple meters on a manifold would count as one assembly.

Inspection Checks:

- Cold applied tape shall be installed in accordance GFP (GFP 4510.1100).
- Wax tape applied in accordance with GFP 4510.1130
- Mastic applied in accordance with GFP 4510.1110.
- Meter set assemblies shall have paint applied to all exposed metal surfaces in accordance with GFP 4510.1140 (GOS 2600.1100.7.3)
- If atmospheric corrosion is present on existing MSA fuel line, "Customer Notification Tag - Meter Inspection Notice" is left for the customer (GFP 4510.1140 Figure 1).
- Painting temperature requirements followed (GFP 4510.1140).
- Painting steps when moisture is present followed (GFP 4510.1140 Step 3 pg. 2 of 5).
- Painting dry time requirements followed (GFP 4510.1140).
- Painting air temperature requirements followed (GFP 4510.1140).

Notes and Best Practices: Be sure and verify complete paint coverage including pipe threads and any factory-applied paint that is cracked, chipped, or scarred during installation to ensure the holiday is cleaned and re-painted. A best practice is to paint all pipe installed when connecting the meter to the customer's fuel line.

Exposed pipe shall be completely dry before primer or paint is applied. Over spray on finished walls should be brought to the Service Providers attention. A common practice is to primer and paint some bare steel fittings in advance in dry conditions to use on wet days. Once installed the pre-painted fittings require only a minor touch-up. Commercial/industrial risers (with template bar) shall be painted to prevent rusting even though the crew is not setting the meter.

Factory applied mill coatings do not require painting unless chipped or cracked. Colors other than gray are acceptable.

Irregular fittings are those that do not have smooth contour and cannot be wrapped easily with cold applied tape, such as flanges and valves.

Inspection Steps:

1. **Inspect all painted areas of the meter set including the threaded areas of fittings.**
2. **Check any scaring wrench marks or cracked existing paint for proper repair.**
3. **Mud, dirt, and excess pipe dope should not be painted over.**
4. **If customer fuel line has corrosion, check if customer notification tag was left with customer.**
5. **Primer and paint should be applied to all areas directly worked on.**
6. **Document findings in QM database.**
7. **Note any deviations, if deviations are found, call area superintendent and email report to all on the QM deviation list.**

Inspection Item: Initial Backfill Material

Pertains to:

This pertains to select material under the pipe
(a.k.a. bedding) and select material over the pipe (a.k.a. shading)

Calculation of points:

Initial Backfill points are calculated using the 100' rule. One point for all initial backfill along 100 lineal feet of trench. Each additional 100' section inspected counts as an additional point.

Inspection Checks:

- If the trench bottom contains any sharp or unusually rough surfaces, a minimum of 4 in. of initial backfill is required to bed the pipe, unless the carrier pipe is encased or the pipe is wrapped in an approved rock shield material. (OS 2525.1800 sec 4.1).
- Initial backfill shall consist of sand, native soil, or soil-based material that does not contain sharp rocks or rocks larger than ½ in. diameter (OS 2525.1800 sec 4.2).
- Initial backfill shall provide firm support under and around the pipe and shall be used for at least the first 6 inches of cover over the pipe after compaction (OS 2525.1800 sec 4.2).
- Initial backfill shall be used for the first 12” of cover, after compaction if the final backfill contains rocks larger than 8” in diameter. (OS 2525.1800 sec 4.3.1)
- Do not unload or backfill or pile it directly on top of PE pipe until proper support is provided for the pipe (OS 2525.1800 sec 3.4).
- Rock shield in lieu of initial backfill is used with steel pipe and not PE pipe (OS 2525.1800 sec 4.4.1.2 and 4.1.3).
- In cases where approved CDF is used as backfill, initial backfill shall be installed under, around, and over the pipeline as necessary to provide a minimum of 6 inches of separation between the pipeline and the CDF. (OS 2525.1800 sec 8.1).
- Crew placed or observed the placement of the initial backfill (OS 2525.1600 sec 6.2).
- When backfilling subsequent to maintenance or repair of an existing pipeline, including service riser replacements, and when the location being backfilled is not under a hard surface that is subject to vehicular traffic, initial backfill may be native material that is well-graded or poorly graded native soil that does not contain fines; angular or sub angular rocks; or rounded or sub rounded rocks larger than 1/2-inch diameter (OS 2525.1800 sec. 4.2.1.1)
- Backfill material shall not contain garbage, cans, glass, decomposable organic material, construction debris, washed gravels (including pea gravel), materials that will not compact, sharp objects, frozen clods, large rocks and stones, pieces of pavement, wood skids or wedges, timbers, hay bales, boulders, or other materials that may cause damage to the pipe, pipe coating, or casing/conduit (OS 2525.1800 sec 3.2).
- Sand meeting the requirements of PSE specification (1275.1380) shall be used for initial backfill. Exceptions allowed in OS 2525.1800 sec 4.2.1.1

Inspection Steps:

1. **Always carry sand on your truck to use after digging up a service.**
2. **Crew has backfilled with proper initial material.**
3. **If crew is backfilling with equipment, make sure caution is taken to not contaminate initial backfill material.**
4. **If on site with crew, confirm that pipe is supported prior to sand being dumped on top of it.**
5. **Confirm that the initial fill has no sharp objects or rocks larger than ½" in diameter.**
6. **4" of initial fill under pipe if trench bottom has any rough or sharp surfaces. 6" initial fill over the top of the pipe.**
7. **Initial fill must comply with PSE requirements.**
8. **Document findings in QM database.**
9. **Note any deviations, if deviations are found, call area superintendent and email report to all on the QM deviation list.**

Inspection Item: Final Backfill Material

Pertains to:

This pertains to material other than initial backfill used to fill in the excavation.

Calculation of points:

Final Backfill points are calculated using the 100' rule. One point for all final backfill along 100 lineal feet of trench. Each additional 100' section inspected counts as an additional point.

Inspection Checks:

- Final backfill shall be sufficient to with stand normal wear and tear from foot traffic, weather, and other activities that may cause erosion (OS 2525.1800 sec 5.3).
- Final backfill shall not contain rocks larger than 10 inches in diameter, except as allowed in 5.2.1 (OS 2525.1800 sec 5.2).
- Steel pipe 8” and larger in diameter may have rocks up to the lesser of 12” in diameter or 100 pounds. (OS 2525.1800 sec 5.2.1)
- Backfill material shall not contain garbage, cans, glass, decomposable organic material, construction debris, washed gravels (including pea gravel), materials that will not compact, sharp objects, frozen clods, large rocks and stones, pieces of pavement, wood skids or wedges, timbers, hay bales, boulders, or other materials that may cause damage to the pipe, pipe coating, or casing/conduit (OS 2525.1800 sec 3.2).
- Where municipality requirements for CDF conflict with PSE specification (1275.1475) the municipality requirements should be followed.

Notes and Best Practices: In cases where approved CDF is used as backfill, initial backfill material shall be installed under, around, and over the pipeline as necessary to provide a minimum of separation between the pipeline and the CDF. (OS 2525.1800 sec 8.1) Refer to the inspection item for Initial Backfill for this inspection check.

Inspection Steps:

1. **Confirm that final fill does not contain any garbage or construction debris.**
2. **When excavating, check backfill material to assure it meets OS requirement.**
3. **Dig with caution not to damage pipe or other facilities.**
4. **When excavation has exposed gas piping, measure for depth of service and layers of backfill material (initial & final).**
5. **Backfill and compact as required.**
6. **Grade and clean area.**
7. **Check backfill material to assure it meets GOS requirements.**
8. **Document findings in QM database.**
9. **Note any deviations, if deviations are found, call area superintendent and email report to all on the QM deviation list**

Inspection Item: Cover and Pipe Depth

Pertains to:

The minimum cover required in PSE standards, which shall be in place over natural gas main or service. And the minimum installation depth requirements permitted by municipalities. Reinforced concrete cap in lieu of pipe depth is also inspected under this item.

Calculation of points:

Cover points are calculated using the 100' rule. One point for all cover along 100 lineal feet of trench. Each additional 100' section inspected counts as an additional point.

Inspection Checks:

- Transmission lines, mains and services shall not be gassed up until there is the minimum depth of cover is met in accordance with (OS 2525.1700) with acceptable backfill in accordance with (OS 2525.1800 and 2525.1600 sec 6.4)
- PE pipe inserted in conduit must still be provided with the minimum cover before being gassed up (OS 2525.1800 sec 3.3).
- Service lines in right of way shall be buried with a minimum cover of 18 in. (OS 2525.1700 sec 7.5.1).
- Service lines on private property should have 18" cover, and shall be buried with a minimum 12" of cover from final grade (OS 2525.1700 sec 7.5.1.1).
- Intermediate pressure (IP) and low pressure (LP) mains should normally be buried with 30" of cover and shall be buried with a minimum of 24" of cover (OS 2525.1700 sec 7.4.2).
- For service lines under drainage/bar ditches, 24" of cover is required. Cover shall be measured from the lowest point of the ditch (OS 2525.1700 sec 7.5.3).
- For gas mains under drainage/bar ditches, 36" of cover is required. Cover shall be measured from the lowest point of the ditch (OS 2525.1700 sec 7.4.6).
- Pipe in Right of Way is installed to meet minimum depth requirement of permitting municipality (OS 2525.1700 sec 7.1).
- The minimum cover over any buried gas facility shall not be less than 12 in. without the specific approval of the Manager Standards even if a protective cap could be installed (OS 2525.1700 sec 7.3).
- If an underground structure or formation prevents a small portion of the main or service from being installed with the minimum cover required a protective cap shall be installed (OS 2525.1700 sec 7.7.1).
- The cap shall be separated from the carrier pipe by a minimum of 6 in. of select, well compacted backfill material that meets the initial backfill requirements in OS 2525.1800 (OS 2525.1700 sec 7.7.2).
- Reinforced concrete cap (in lieu of pipe depth) is cast in place at least 4 inches thick, with a compressive strength of 3000 psi and colored with a red dye (OS 2525.1700 sec 7.7.3).
- All commercial and industrial services 1 ¼" or larger shall be buried with a minimum of 24"cover unless approved by the Manager Contract Management (OS 2525.1700 sec 7.5.2).
- The customer can dig to within 1 foot of the gas stub marker at the property line work pit.
- The customer shall not expose the gas pipe or the gas service stub (OS 2525.1600 sec 4.1.2).

Notes and Best Practices: Cover requirements indicate the minimum cover over buried gassed up pipelines. Cover refers to the distance between the surface of the backfill and the top of the pipe/conduit regardless if the trench is completely filled to final surface grade. Depth refers to the distance between final surface grade and the top of the pipe/conduit regardless if the trench is backfilled.

Inspection Steps:

1. **If on a post audit, uncover pipe with caution.**
2. **Measure depth of exposed pipe to confirm it meets GOS requirements.**
3. **Check anodeless risers to make sure bury line is above final grade**
4. **Document findings in QM database.**
5. **Note any deviations, if deviations are found, call area superintendent and email report to all on the QM deviation list.**

Inspection Item: Clearances - Underground

Pertains to:

This pertains to clearances from underground encroachments (non gas facility) such as other utilities (pipe, wires, guys, posts, poles), sewer, storm pipes, underground vaults, septic tanks, buildings (footings, foundations), steam lines, obstacles (piles, dead man, very large boulders), etc.

Calculation of points:

Clearance points are calculated using the 100' rule. One point for all clearances along 100 lineal feet of trench. Each additional 100' section inspected counts as an additional point.

Inspection Checks:

- Mains shall be separated at least 12" from the building and structure footings or foundations when the pipe runs parallel to the building. If 12" separation cannot be maintained the pipe shall be shallower than the bottom of the footing or foundation (OS 2525.1700 sec 6.5.1).
- Services should be separated at least 12" from the building and structure when the pipe runs parallel to the building. Where 12" of separation cannot be maintained, the pipe shall be shallower than the footing or foundation (OS 2525.1700 sec 6.5.1).
- IP & LP mains and services installed to meet required clearances (OS 2525.1700 sec 6.6).
- IP & LP services installed to meet required clearances (OS 2525.1700 sec 6.7).
- Meet clearance from power (OS 2525.1700 sec 6.6.2.1, 6.7.1.1, 6.7.2.2).
- In no case shall gas facilities be in direct contact with non-gas structures. This does not apply when the pipeline is encased in accordance with sec 6.7 and the other non-power utility is also in casing or conduit (OS 2525.1700 sec 6.7.3).
- For new JT construction, other utilities shall not be placed above gas piping (with the exception of crossing utilities) anywhere in the clearance zone (OS 2525.1700 sec 6.8 figure 6-1).
- Polyethylene gas mains and services (either direct bury or in casing) shall not be closer than 50 ft. from any active steam lines under any circumstances (OS 2525 .1700 sec 6.13).
- No metal objects or unapproved devices used to maintain separation from other utilities in JT excavations (OS 2525.1200 sec 6.7.2).
- Pipelines crossing under stream crossing culverts shall maintain 12" clearance from the bottom of the culvert (OS 2525.1700 sec 6.4).
- Expose all utilities in the plowing or hole hogging path to verify location and depth (OS 2525.1200 sec 9.6)
- Clearance between PE pipe and bond cable 3" minimum under pipe (GFP 4510.1030)

Notes and Best Practices: "Facilities Crossing" is defined as two facilities that cross at or greater than a 45 degree angle. Any angle less than 45 degree shall be viewed as parallel facilities (OS 2525.1700 sec 6.1).

All references to power in the clearance Standards include ground rods and ground wires (OS 2525.1700 sec 6.14).

Pertaining to "clearance zone" (OS 2525.1700 sec 6.8) the installation crews have no control over what is installed above gas facilities after their work is completed, but they should notify PSE anytime there is an indication that someone is planning to "stack" another facility over the gas pipe in conjunction with a JT installation.

Inspection Steps:

1. **During post audit, expose 12" around gas piping to measure for clearances from other facilities**
2. **When gas line is exposed, measure distance between gas and other facilities**
3. **Inspect bore/direction drill area to make sure all other facilities have been exposed and measured for depth prior to start of hole hogging or drilling.**
4. **Document findings in QM database.**
5. **Note any deviations, if deviations are found, call area superintendent and email report to all on the QM deviation list.**

Inspection Item: Inserted Pipe

Pertains to:

Inspecting inserted mains or services in PVC conduit and inserting pipe (PE or Steel) in existing facilities.

Calculation of points:

One inspection point for the first 100' of inserted pipe inspected. For larger jobs count an additional point for each additional 100' segment inspected. One point for each service inspected. Does not include clearance sleeves.

Inspection Checks:

- Service conduit provided by the customer is schedule 40 PVC (white or yellow) with no reference to any other utility type such as water or sewer (OS 2525.2000 sec 4.2).
- All conduits buried for the purpose of future gas line insertion shall meet the requirements of PSE Specification 1025.6335, except as provided in (OS 2525.2000 sec 4.1)
- The leading end of the pipe being inserted shall be capped (OS 2525.2000 sec 8.2 & 2525.1900 sec 4.11 & 2525.2100 sec 7.6).
- When main is installed in a casing or conduit both ends are sealed (OS 2525.1900 sec 4.1).
- A service line installed in conduit must be sealed at the casing end nearest the building wall (OS 2525.1900 sec 4.2).
- Sealant shall completely surround the carrier pipe in a manner that prevents the carrier pipe from touching the conduit (OS 2525.2000 sec 8.6.1)
- For sealing gas lines inserted into large- diameter casings, order 20 cu-ft. kit using MID 9995991.
- When a service is installed in conduit, the end of the conduit at the property line or street (that is not sealed) shall have a mucket, or some other equivalent means, installed to prevent the carrier pipe from touching the end of the conduit (OS 2525.1900 sec 4.2.1).
- Aqua Seal not used on gas pipe greater than 1-1/8" or casing greater than 2" (GFP 4575.1050 pg. 4).
- Aqua Seal is wrapped at least twice around the carrier/casing transition (GFP 4575.1050 pg. 4 step 2).
- Aqua Seal is completely covered (over wrapped at least twice) with 1½" PVC tape (FP 4575.1050 pg. 4 step 2).
- Conduit diameter is at least the minimum size specified in the Standards (OS 2525.2000 table 5.1).
- Conduit for main road crossings in plats shall be a minimum of 4" in diameter (OS 2525.2000 sec 5.2).
- Conduit for service road crossings in plats shall be a minimum of 2" in diameter (OS 2525.2000 sec 5.3).
- If a mechanical fitting is placed inside the conduit, it shall be noted on the as-built records (OS 2525.2000 sec 8.4).
- PE casing pipe sized per Standards (OS 2525.1900 Table 3-1).
- Casing pipe free of sharp or unusually rough surfaces (OS 2525.2100 sec 7.4).
- Plastic insert protectors (muckets) shall be installed between casing pipe ends and PE pipe to protect the inserted PE pipe from damage at the casing opening (OS 2525.2100 sec 7.5).
- If the carrier pipe is steel install a casing insulator or plastic doughnut at the end of the pipe to protect the exposed end of the pipe wrap. (OS 2525.1900 sec 4.11)
- Whenever PE pipe is encased suitable precautions shall be taken to prevent crushing or shearing of the plastic pipe where it exits the casing (OS 2525.1900 sec 4.6).
- Each facility abandoned in place or each line not subject to gas pressure shall be disconnected from all sources and supplies of gas, sealed at both ends with. (OS 2525.3600 sec 3.1).

- **Notes and Best Practices:** OS 2525.2000, Conduit-Inserted Polyethylene Pipelines, does not apply to casing pipe that is installed by horizontal directional drilling (OS 2525.2000 sec 3.8).

Inspection Steps:

1. **Confirm that gas piping and locate wire is centered in casing.**
2. **Main inserted in casing is sealed at both ends.**
3. **Service line in casing is sealed at the end nearest the building.**
4. **Proper sized casing is being used.**
5. **Conduit meets PSE requirements.**
6. **Muckets are being used.**
7. **Document findings in QM database.**
8. **Note any deviations, if deviations are found, call area superintendent and email report to all on the QM deviation list**

Inspection Item: Leak Testing

Pertains to:

All new temporarily abandoned, relocated or replaced pipelines shall be tested before being placed in service. Also covers pre-tested repair pipe and soap test of MSA.

Calculation of points:

One inspection point for each test required on the job.

Inspection Checks:

- Maximum test pressure on PE pipe shall be 120 psig (OS 2525.3300 sec 4.1.2).
- Service lines are tested with test pressure maintained for a minimum of 15 minutes, at a minimum of 90 psig but no higher than 120 psig (OS 2525.3300 sec 8.8).
- Pipelines (excluding services) test pressure shall be maintained for the minimum duration as specified in the Standards (OS 2525.3300 table 5-1).
- With the exceptions of pipeline repairs, tie- ins, and certain fabricated units and short sections of pipe, all leak and strength tests shall be performed on pipe after it has been installed, and covered at a minimum with initial back fill per OS 2525.1800 (OS 2525.3300 sec 3.1.1).
- Service tested from point of break or disconnect to MSA valve (OS 2525.3300 sec 8.13.2)
- On damaged service, performed bar-hole survey over portion of service that remained active and was not pressure tested (OS 2525.3300 sec 8.13.3).
- All non-rated fittings, control lines, RTU and pen gauge connections, and other appurtenances shall be leak and strength tested in accordance with the type of facility on which they are to be installed (OS 2525.3300 sec 9).
- When a pipeline is installed and tested in segments, results of each test shall be recorded (OS 2525.3300 sec 10.1.1).
- A calibrated pressure recording gauge shall be used on all test segments of 1000’ or more in length. (OS 2525.3300 sec 5.5).
- Pressure recording gauge pen/chart indicates the time of day that the test actually began (OS 2525.3300 sec 5.5.1).
- The time for the test duration should be for test results only, not for the total length of time the segment is left pressurized after the test‘s completion (OS 2525.3300 sec 10.1.2).
- The test downstream of the regulator must include all company piping up to the tie-in to the customer‘s fuel line (OS 2525.3300 sec 8.11, GFP 4625.1000).
- Services have all exposed fittings and pipe connections tested with soap suds during the test period (OS 2525.3300 sec 8.6).
- When reinstating a service that has been physically disconnected from the main, the line must be tested in the same manner as a new service line (OS 2525.3300 sec 8.13.2).
- When inserting a segment consisting of multiple pipe lengths joined above ground, the entire segment shall be leak tested both before and after insertion. (OS 2525.2100 sec 7.10.2).
- Air testing IP mains in Kittitas County utilizing an air compressor, an after cooler with downstream water separator shall be used. (OS 2525.3300 sec 3.8 & GFP 4625.1030.
- Rated fittings that meet or exceed MAOP need only be tested at operating pressure with soap suds when placed into service (OS 2525.3300 sec 5.7).

Notes and Best Practices: All pipe shall be leak tested. Pipe used for repairs shall be tested before installation if it can’t be tested with the pipe downstream of the break. (OS 2525.3300 sec 3.1.2 and 3.1.3)

PE caps, except for Lycofit caps do not carry a manufacturers rating and must be tested with facility being built. Threaded and steel caps must be tested with the facility being built. (June 2000 Word Document).

Inspection Steps:

1. **Confirm crew tested piping as required per GOS and test instruments are approved.**
2. **Exposed fittings soaped during air test.**
3. **Range of air test was between 90-120 psi.**
4. **At service riser, check for riser valve in open position and nipple to be used upstream of regulator is part of air test.**
5. **Once MSA is set, soap test from reg. to fuel line tie-in.**
6. **Soap test MSA to check for possible leaks per GFP 4625.1000. After soap test is complete, rinse residue with clean water.**
7. **If any leaks are found, call area superintendent to let them know of the deviation and to have a crew sent over to fix the leak.**
8. **If the contractor cannot get to the site in a timely manner, call dispatch and have GFR person show up to make the repairs.**
9. **Document findings in QM database, leaks are considered to be NHAGR, if found on above ground piping.**

Inspection Item: Purging

Pertains to:

Purging mains and services.

Calculation of points:

One point maximum for each purge on the job.

Inspection Checks:

- Purge procedure performed by individual currently qualified under PSE's OQ Program or person who is continually and directly observed by a qualified person (GFP 4700.1500 pg. 1).
- All pipelines shall be purged of air before packing with gas (OS 2525.3400 sec 9.1).
- Public officials and residents in the vicinity notified if it is anticipated that they may be affected by noise, odor, traffic disturbances, or possibility of accidental ignition (OS 2525.3400 sec 10).
- Any section of main longer than 5 feet purged (OS 2525.3400 sec 9).
- Before any purging operation is initiated, purge connections shall be available in order to achieve and maintain the desired rate of flow within the pipeline (OS 2525.3400 sec 4.1).
- Plastic pipe shall not be used for purge vent piping (OS 2525.3400 sec 6).
- Service lines shall be purged through a grounded service riser equipped with a MSA valve (OS 2525.3400 sec 9) and GFP 4700.1500).
- Vent piping shall be orientated to direct the purged gas away from workers, the public, and all property (OS 2525.3400 sec 6.5).
- Vent piping shall be vertical metal of sufficient height with an approved control valve of the same size (OS 2525.3400 sec 6).
- Vent stack is secured in place (2575.2000 sec 3.2.1).
- Minimum purge flow rates attained per the Standards (OS 2525.3400 table 6-2 and GFP 4700.1500).
- Inert separators are used when required (OS 2525.3400 and GFP 4700.1500).
- The specified amount of nitrogen is used as an inert separator (GFP 4700.1500 & OS 2525.3400).
- Purge shall begin within 3 minutes of injecting the inert separator (GFP 4700.1500).
- A calibrated CGI shall be used to verify a 0% gas environment. OS 2525.3400 sec. 10.1.2.1
- A calibrated CGI shall be used to verify a 100% gas environment. OS 2525.3400 sec. 9.4.2
- Each facility abandoned in place or each line not subject to gas pressure shall be disconnected from all sources and supplies of gas, purged in accordance with OS 2525.3400 (OS 2525.3600).
- When purging a main, a service riser on a service cannot be used as a purge vent if the service has an EFV (2525.3400 sec 6).
- To prevent development of a static electrical charge on PE pipe, the pipe purge end shall be grounded as specified in the Standards (OS 2525.3400 sec 6).
- Whenever gas is being vented into open air, efforts shall be made to identify and remove each source of ignition from the area refer to sections (OS 2575.2000 sec 3.2).
- No smoking or open flames in areas or structures where a combustible mixture of gas and air may exist (OS 2575.2000 sec 3.2.2).
- When a hazardous amount of gas is being vented into open air or could result in an uncontrolled release of gas such as welding fusing, squeezing or tapping on live gas at least one fire extinguisher shall be readily available at the work site (OS 2575.2000 sec 4.1.
- When there is a controlled release of gas a manned fire extinguisher is required any time the control valve is 2 in. or larger and is located within the danger area (OS 2575.2000 sec 4.3.4).
- When a pipeline is being purged, the purge gas shall be introduced into one end of the line in a moderately rapid and continuous flow to prevent formation of a potentially hazardous combustible mixture of gas and air (OS 2525.3400 sec 3.2).

Notes and Best Practices: Service lines shall not be purged through the svc regulator.

Inspection Steps:

1. **Fire extinguisher available per GOS.**
2. **Inspect purge riser/service is grounded and has control means.**
3. **CGI used for purge to 100% gas.**
4. **Document findings in QM database.**
5. **Note any deviations, if deviations are found, call area superintendent and email report to all on the QM deviation list.**

Inspection Item: Squeezing Pipe

Pertains to:

Hydraulic and manual squeezing (and release) of PE Pipe (GFP 4700.1300 & 4700.1310).
Squeezing of Steel Pipe (GFP 4700.1210).

Calculation of points:

One point maximum for each squeeze stop-off observed.

Inspection Checks:

Squeezing of PE Pipe GFP 4700.1300 / GFP 4700.1310

- Before Squeeze: Hydraulic PE Squeezers GFP 4700.1300
- Verify approved and proper sized squeezer used, with the proper bottom bar
- Squeezer is checked for damage, oil level, and dry run performed with Hydraulic(pg. 3)
- Selecting Squeeze point (GFP 4700.1300 or GFP 4700.1310)
- Inspection of pipe per GOS 25751800 for gouges, damage, or defects
- Select location for gauge to monitor pressure.
- Select a PE squeeze point that is a minimum of three pipe diameters or 12 inches, whichever is greater, from fittings, fusion point, or previous squeeze points. PE not squeezed in the same location twice.
- Squeezing the PE Pipe (GFP 4700.1300–pg. 5 or GFP 4700.1310-pg 7)
- Do not bend / hinge PE pipe at squeeze point (GFP 4700.1300 pg. 1 and GFP 4700.1310 pg. 1).
- Squeezers centered on pipe and set at 90 degrees to the pipe (GFP 4700.1300, Fig.2 & 3
- Do not place the PE squeezer over burlap as this could result in damage to the pipe.(GFP 4700.1300 pg. 5 step 2)
- Hydraulic – slowly squeeze pipe by pumping cylinder to the pressure of 3750 psi, then allow 1 minute per diameter of pipe size for cold flow (*allow double relax time if temperature is below freezing), then repeat (steps 4,5,&6)
- Mechanical – squeeze pipe at a rate of 1 minute per diameter inch of pipe – 2” pipe= 2 minutes.(GFP 4700.1310 pg. 7 step 4)
- Install saddle clamps when required. (GFP 4700.1300 pg. 5 step 7)
- Releasing the squeezer (GFP 4700.1300 pg. 6 or GFP 4700.1310 pg. 10
- Remove saddle clamps. (4700.1300 pg. 6 step 1)
- Release the squeeze slowly, at a rate of 2 minutes per diameter inch of pipe (4” PE =8 Min)
- Remove squeezers-check pipe for damage and perform soap test of squeeze area
- Wrap entire are with red tape
- Cold Squeezing of Steel Pipe GFP 4700.1210 & GFP 4700.1220
- No permanent steel squeeze on pipe greater than 3” in diameter (GFP 4700.1210 pg. 1 & 4 and GOS 2525.1100 sec 8.4).
- Examine pipe in accordance to GFP 4515.1755 – examining steel pipe, EPCR.
- Remove wrap from pipe. If Coal Tar wrap see GFP 0150.3250
- Examine pipe for defects, girth weld, and longitudinal seams. Do ***not*** squeeze on girth welds or defects
- Select squeeze point directly over longitudinal seam, while maintaining 90 degree angle between squeezer and pipe.
- Squeezing of steel pipe (GFP 4700.1210 pg. 4 & GFP 4700.1220)
- Squeeze pipe until the gas flow stops or minimum jaw distance has been reached. See table 1 for jaw distance.
- If double squeeze, reset squeezer 12” upstream of 1st squeeze (GFP 4700.1220 pg. 2, step 2)

- When retiring a steel service, a 6 inch long metal reinforcement (angle iron or 1" pipe strap) is welded across the squeeze (GFP 4700.1220 pg. 2 step 4, GOS 2575.1700 sec 10.5).
- A manned fire extinguisher shall be present when welding
- Install Bonding Cables across squeeze that will be cut (GFP 4700.1210 step 1).

Notes and Best Practices: A double squeeze may be necessary to achieve a 100% shut off (GFP 4700.1300 pg. 5 step 6). Re-rounding squeezed pipe by side squeezing is not allowed. PE squeezes performed with non-approved equipment cut out and replaced (GFP 4700.1300 pg. 1 and GFP 4700.1310 pg. 1).
**Mechanical Squeezer #TR650 has different procedures – see GFP 4700.1310

Inspection Steps:

1. **Check squeezers for working condition.**
2. **Squeezers are set properly on pipe and meet clearances from other fittings or fusion/welds.**
3. **Check to make sure GFP is followed.**
4. **Once squeezers are removed, red tape applied to squeeze area on pe pipe.**
5. **Document findings in QM database.**
6. **Note any deviations, if deviations are found, call area superintendent and email report to all on the QM deviation list.**

Inspection Item: Exposed Facility Protected

Pertains to:

Above ground facilities that are installed or located in the proximity of vehicles which could potentially cause damage to the facility. This inspection item is also applicable when facilities are located in protective areas in lieu of guard posts.

Calculation of points:

One point maximum for each facility location. For example a 4-plex building with a 2-mtr manifold on each end properly protected would be 2 inspection points (one for each MSA).

Inspection Checks:

- In Snow country above ground facilities are protected as specified in the Standards (GOS 2525.3700 sec 3).
- In Flooding Areas – regulator vent requirements as specified (GOS 2525.3700 sec 4)
- Guard posts shall be installed to protect above ground facilities from vehicular damage that may be anticipated (OS 2525.3700 sec 6.1).
- MSA installed behind curbs – 10’ space required for rolled curbs/ 7’ space required for vertical face curb (GOS 2525.3700 sec 6.1.2)
- The meter shall not be installed until all the guard posts have been installed, except when guard posts would interfere with the meter installation such as large commercial and industrial MSA (GOS 2525.3700 sec 6.2).
- In no case shall the meter be turned on until required guard posts have been installed (GOS 2525.3700 sec 6.3.1).
- Guard posts should be painted caution yellow, especially for commercial/industrial locations, in street right of ways, and alleys (GOS 2525.3700 sec 6.5)
- Residential guard post requirements (GOS 2525.3700 / GOS 2550.1800)
- If the MSA is subject to vehicular damage from more than one direction (i.e.- can be struck head on or at an angle due to a wide driveway or parking area) the following additional requirements apply (GOS 2525.3700).
- Except as allowed in sec 6.5.2.1, a minimum of two guard posts shall be installed to protect a single-family residential MSA (GOS 2525.3700).
- Commercial/Industrial or Multifamily guard post requirements (GOS 2525.3700 sec)
- When necessary to set guard posts, each post shall meet the requirements in GOS (2525.3700 sec 6) sketches showing details.
- When performing meter change outs personnel shall ensure the meter was not installed near a driveway, delivery doors or other high traffic areas where it may be subject to damage by a vehicle. If it is not possible to move the meter away from these areas, install guard posts (GOS 2550.1800)

Notes and Best Practices: The MSA should not be installed near a driveway, delivery doors, or other high-traffic areas where it may be subject to damage from a vehicle. Look for nearby building damage or other indicators of vehicle damage that has already occurred. If it is not possible to install the meter away from these areas, install guard posts meeting the requirements of GOS 2550.1800. Even if guard posts can be installed for a meter set in a traffic area, the Manager Contract Management may, at his or her discretion, specify that the MSA be located elsewhere (OS 2550.1800).

Inspection Steps:

1. **In snow country or flood zones, inspect exposed facilities to make sure they meet GOS requirements.**
2. **Check MSA if protection is required.**
3. **If protection is in place, make sure guard posts are set per GOS.**
4. **Check guard posts for paint and concrete cap.**
5. **Document findings in QM database.**
6. **Note any deviations, if deviations are found, call area superintendent and email report to all on the QM deviation list.**

Inspection Item: Restoration

Pertains to:
Job site clean-up, temporary asphalt patches, lawn & landscaping restoration.

Calculation of points:
Restoration points are calculated using the 100' rule. One point for all restoration along 100 lineal feet of trench. Each additional 100' section inspected counts as an additional point.

Inspection Checks:

- All areas where earth has been moved, equipment has operated, or material was stored, shall be restored as close to their original profile and condition as practical (OS 2525.1700 sec 8.1).
- Grading of unimproved right-of-way shall minimize interference with existing drainage. All grading shall be finished to restore the drainage or water flow conditions as close to original condition as practical and shall conform to regulations of governmental authorities having legal jurisdiction (OS 2525.1700 sec 8.1.1).
- All surplus excavated material, debris, or construction material shall be removed from the job and the site left in a clean and neat condition. All paved areas shall be washed or swept to remove spoil (OS 2525.1700 sec 8.1.2).
- Lawn areas shall be graded and sod replaced at original ground level. In areas where the turf has been destroyed, sufficient top soil shall be added to bring the area to its original grade and shall be re seeded with a good grade of lawn seed (OS 2525.1700 sec 8.1.3).
- When excavating through lawn areas, the sod shall be carefully removed from the area and laid aside for replacement after the pipe is installed. The sod shall be protected from damage and replaced in a manner satisfactory to the customer (OS 2525.1700 sec 5.6.1)
- The surface of all roads and streets shall be restored to a condition that is similar to the original surface. Drainage ditches, drain tile, and culverts that were impacted by the construction shall be restored or relocated to the satisfaction of the agency providing the permit (OS 2525.1700 sec 8.1.4).
- All damaged paving; sidewalks, curbs, and paved driveways shall be replaced to the satisfaction of the permitting agency and the Company Representative (OS 2525.1700 sec 8.1.5).
- The excavator, whether Company or contractor crew, shall be responsible for controlling or repairing settlement of back fill for a period of time, which varies for different jurisdictions in PSE service territory. (OS 2525.1700 sec 8.2).
- Deactivated CP boxes, valve boxes shall be filled or removed except as approved by MGR-Contract Management (OS 2525.2100 sec 9.4 and 9.5).
- Take care to protect the customer's property (shrubs, house et cetera) from over spray when using aerosol paint. Avoid painting on windy days (GFP 4510.1140 pg. 2).

Notes and Best Practices: In wet conditions roads not adequately swept may produce sediment washing away from the construction site. In dry conditions or areas where sediment run off is not a problem, poorly swept roads would be captured under this Inspection Item along with the other restoration checks.

Backfill humps and speed bumps are considered Restoration problems.

If a temporary road patch is poorly installed so that it is found to be falling apart and cold mix is being thrown from the area by vehicles then the problem should be captured as a "Restoration" deviation. But if the cause of the temporary road patch failure is due to improper compaction of the backfill soil (e.g., ground under the temporary patch is sunken or spongy) then the deviation should be captured as "Compaction" and not "Restoration" because the primary cause of the problem can be attributed to a failure to have properly compacted final backfill.

Inspection Steps:

1. **Inspect area for construction debris.**
2. **Inspect Restoration, it shall be close to original conditions, sod, topsoil/seed, & area swept clean.**
3. **Inspect existing building for paint overspray.**
4. **If cold mix patch, check patch.**
5. **Document findings in QM database.**
6. **Note any deviations, if deviations are found, call area superintendent and email report to all on the QM deviation list.**

Inspection Item: Valve – Main, Service, Excess Flow

Pertains to:

Valve installation and requirements.

Calculation of points:

One point maximum for each valve installed or required.

Inspection Checks:

- Curb valves required on all new IP services 1-1/8 in. and larger, all new LP services 2 in. and larger unless the service is less than 30' long (with an outside MSA) or an Excess Flow Valve (with an outside MSA) is installed (OS 2525.2600 sec 8).
- If the stub and the extension are two different sizes, the size of the stub shall be used to determine whether a curb valve is required (OS 2525.2 600 sec 8.3).
- A three foot whip of 5/8 in. PE pipe may be substituted for a curb valve on existing 1-1/8 in. PE LP services that are being converted to IP (OS 2525.2600 sec 8.5.3).
- Service tees with internal valves may be used as curb valves if they are installed in a curb valve box (OS 2525.2600 sec 8.4).
- Curb valves shall be placed in accordance with (OS 2525.2600 sec 6.2.3.1)
- Curb valves shall be supported by means other than the service piping (OS 2525.2600 sec 8.8).
- Plastic curb valves shall be supported with prefabricated valve support boxes (1-1/8 in. through 4in.) (OS 2525.2600 sec 8.8.1).
- Non plastic curb valves shall be supported by bricks or sand bags (OS 2525.2600 sec 8.8.2).
- The top of the box should be flush with the existing grade (OS 2525.2 600 sec 3.4.3).
- If the service enters the building underground and a riser valve is not feasible to install, then a curb valve is required on the service line (OS 2550.1900 sec 4.1).
- On new service installations or complete service replacements, the size of the service piping downstream of the EFV shall match the size of the EFV (i.e. no reducer shall be installed between the EFV and the meter set assembly. (OS 2550.2200 sec 3.1.1).
- EFV installed as specified in the Standards and Procedures (OS 2550.2200, OS 2550.1500, and GFP 4575.1070).
- Verify spacing between main valves per standards (OS 2525.2600 sec 3.6 and sec 6).
- Main valves placed in specific locations per standards (OS 2525.2600 sec 6).
- Install a main valve when branching off to serve a plat, even if the branching main is the same size (OS 2525.2600 sec 6.2.5).
- Install a main valve anytime a PE branch saddle is installed. A valve shall be installed for branch saddles due to tapping tool limitations and PE squeeze requirements (OS 2525.2600 sec 6.2.4.1).
- Main valve installed in close proximity to both sides of bridges that support gas main (OS 2525.2600 sec 6.2.1).
- Main valve installed on both sides of rivers or other water crossings (OS 2525.2600 sec 6.2.2).
- On the branching main when branching a smaller size main from a 4" or larger main (OS 2525.2600 sec 6.2.3).
- Anytime there is a branch of any size 6 in or larger LP or IP main a valve shall be installed on the branching main (OS 2525.2600 sec 6.3.3).
- If a main valve is installed in a buried box or enclosure, the box or enclosure shall be installed so as to avoid transmitting external loads to the main (OS 2525.2600 sec 3.5).
- Dead end main valves do not require the installation of a valve box (OS 2525.2600 sec 3.4.3.1).
- Systems with different MAOPs or different operating pressures shall be maintained as two isolated systems by one of the methods specified in this standard (OS 2525.2600 sec 3.6.4).

Notes and Best Practices: Valve requirements vary depending on the specific application. Please refer to the Standards for complete information recommended curb valve locations:
1) At the property line, and 2) in the right-of-way between the curb and the sidewalk (OS 2525.2600 sec 8.6). Valves on private property away from vehicle traffic should be installed in a hex nut valve box. Valves in the R/W shall be installed in a street valve box. Top of valve box shall be flush with existing grade.

Inspection Steps:

1. **If crew on site, trip EFV.**
2. **Correct EFV is installed and in the proper location.**
3. **EFV tag at nipple below regulator.**
4. **Document findings in QM database.**
5. **Valve support used.**
6. **Note any deviations, if deviations are found, call area superintendent and email report to all on the QM deviation list.**

Inspection Item: Fusion

Pertains to:

Fusion of all PE mains and services.

Calculation of points:

One point maximum for each fuse inspected.

Inspection Checks:

- Joining of PE pipe shall be done by qualified personnel using approved procedures in accordance with Operating Standard 2700.1600 (OS 2525.1200 sec 3.9)
- Procedures followed when joining pipe by manual butt fusion (GFP 4600.1010)
- Procedures followed when joining pipe by hydraulic butt fusion (GFP 4600.1020)
- Procedures followed when joining pipe by side fusion (GFP 4600.1030)
- Procedures followed when joining pipe by electro fusion and sidewall/saddle electro fusion (GFP 4600.1040 & 1045)
- Install a protective sleeve over the service connection between PE pipe and the service tee. This applies to fusion connections less than 1-1/4" in diameter, and compression connections except for Lycofit couplings (OS 2550.2000 sec 5.4.1)
- When a hazardous amount of gas is being vented into open air, or the work process could result in an uncontrolled release of gas, such as welding, fusing, squeezing or tapping on live gas lines, at least one fire extinguisher shall be available at the work site prior to any individual entering or beginning work in the hot zone (OS 2575.2000 sec 4.1).
- If cuts, gouges, or scrapes deeper than 10% of the wall thickness are present, the damaged pipe shall be replaced (OS 2525.1200 sec 6.13.2)

Notes and Best Practices: Fusion environment should be protected from wind, rain, dust etc. and preventing drafts through open pipe ends. When fusing, PE pipe must be inspected to ensure there are no cuts, gouges, or scrapes deeper than 10% of the wall thickness (OS 2525.1200 sec 6.13). This requirement should be checked under the Inspection Item: Pipe – General Installation/Retirement Requirements.

Inspection Steps:

1. **Check over equipment to confirm that it is in proper working condition.**
2. **GFP is followed for fusion being made.**
3. **Fitter inspects fusion prior to your inspection.**
4. **Ask fitter if the fusion is complete and then inspect fusion for visual approval.**
5. **Fire extinguisher on site if fusing on live main.**
6. **Document findings in QM database.**
7. **Note any deviations, if deviations are found, call area superintendent and email report to all on the QM deviation list.**

Inspection Item: Welding

Pertains to:

Welding of all steel mains and services.

Calculation of points:

One point maximum for each weld inspected.

Inspection Checks:

- When a hazardous amount of gas is being vented into open air, or the work process could result in an uncontrolled release of gas, such as welding, fusing, squeezing, or tapping on live gas lines, at least one fire extinguisher shall be available at the work site prior to any individual entering or beginning work in the hot zone. Refer to (OS 2575.2000 sec 4) for policy on manned extinguishers.
- Only those welders with active cards shall be permitted to weld on Company piping (OS 2700.1100 sec 3.2.1).
- When installing a bare steel casing, a welder who is qualified through training and experience shall perform the weld (OS 2525.1900 sec 3.7).
- Common welding practices followed when welding steel pipe (GFP 4900.1000).
- Specific procedure followed for type of welding being performed (GFP 4900.1200- 2100).
- Transition fittings welded to steel pipe kept continuously wet with a rag placed over the transition and PE portions of the fitting (GFP 4900.1120 step 1).
- Transition fitting has not had the steel portion shortened (GFP 4900.1120 step 3).
- When using mechanical line stoppers to isolate a section of pipe, welding work shall not be performed within 18 inches of a stopper (unless approved by Quality Assurance Inspector). (OS 2575.2000 sec 3.4.2).
- No welder may weld on the Company piping system with a particular welding process unless, within the preceding 6 calendar months, the welder has engaged in welding with that process (OS 2700.1100 sec 6.1).

Notes and Best Practices: During production welding, The Company's authorized representative may request immediate requalification of, or disqualify any welder that produces unacceptable welds or that may not have the necessary skills, even though qualification card is current (GFP 4900.1000 pg. 1).

Inspection Steps:

1. **GFP is followed for weld being made.**
2. **Fitter inspects weld prior to your inspection.**
3. **Ask fitter if the weld is complete and then inspect weld for visual approval.**
4. **Fire extinguisher on site if welding on live main.**
5. **Document findings in QM database.**
6. **Note any deviations, if deviations are found, call area superintendent and email report to all on the QM deviation list.**

Inspection Item: Joining Pipe other than Weld or Fuse

Pertains to:

Joining pipe using means other than welding or fusion.

Calculation of points:

One point maximum for each mechanical fitting installed. Points apply only if the installation procedure was observed.

Inspection Checks:

- Procedures followed when joining pipe with flanged fittings (GFP 4610.1000).
- Follow the specified torque requirements for flanged fittings (GFP 4610.1000 pg. 5-7).
- Follow the specified bolt tightening sequence for flanges (GFP 4610.1000 pg. 5 fig. 1).
- Procedures followed when joining pipe with Dresser compression fittings (GFP 4610.1010).
- Procedures followed when joining pipe with Continental compression fittings (GFP 4610.1020).
- Procedures followed when joining pipe with Lycofit mechanical fittings (GFP 4610.1030).
- Procedures followed when joining threaded pipe (GFP 4610.1040).
- Welded service tee fitting has cooled before installing PE pipe into Continental fitting (GFP 4610.1020, step 3).
- Shear point protected where PE pipe connects to Continental service tees fitting (GFP 4610.1020 pg. 3, step 4 (OS 2550.2000 sec 5.4.1).

Notes and Best Practices: When joining pipe, PE pipe must be inspected to ensure there are no cuts, gouges, or scrapes deeper than 10% of the wall thickness (OS 2525.1200 sec 6.11.2). This requirement should be checked under the Inspection Item: Pipe – General Installation/Retirement Requirements.

Inspection Steps:

1. **Proper GFP is being followed for specific fitting to be installed.**
2. **Inspect fitting during and after installation.**
3. **Pipe dope used when installing threaded fittings.**
4. **Proper torque specs. Used on flanged fittings.**
5. **Lyco fittings installed per GFP.**
6. **Document findings in QM database.**
7. **Note any deviations, if deviations are found, call area superintendent and email report to all on the QM deviation list.**

Inspection Item: Tapping/Stopping

Pertains to:

Tapping and Stopping of all steel pipe for low pressure, intermediate pressure and high pressure systems. It does not pertain to service tees using a self-contained perforator.

Calculation of points:

One point maximum for each Tap or Stop observed.

Inspection Checks:

- Field personnel performing hot taps on gas pipelines are Operator Qualified and new employees that are not currently qualified for a covered task shall not be allowed to perform that task unless they are directly observed during performance of that task (OS 2700.1000 sec 2.1.1, 2.1.2 and OS 2425.2100 sec 5.1).
- No person may be in a hot tap crew unless they have been qualified by the provisions of Operating Standard (OS 2700.1000 sec 3.1and sec 5.1).
- Equipment used for the hot tap operation shall be qualified for use on company pipelines if it meets the provision of Operating Standard 2700.1050 section 3.1 and is used in accordance with the manufacture's recommendations (OS 2700.1050 sec 3.1).
- When using the equipment, the manufacturer's procedures manual shall be on site, except, if there is a field procedure that covers the use of the equipment then the manufacturer's procedure manual does not need to be on site (OS 2700.1050 sec 3.1.1).
- The equipment shall be kept in good working condition and shall be inspected at intervals not exceeding one year. Parts showing excessive wear and or deterioration shall be replaced before the equipment is used again (OS 2700.1050 sec 3.2).
- Procedures followed when hot-tapping PE branch saddles (GFP 4600.1100).
- No smoking or open flames in areas or structures where a combustible mixture of gas and air may exist (OS 2575.2000 sec 3.2.2).
- When a hazardous amount of gas is being vented into open air, or the work process could result in an uncontrolled release of gas, such as welding, fusing, squeezing, or tapping on live gas lines, at least one fire extinguisher shall be available at the work site prior to any individual entering or beginning work in the hot zone. Refer to Section 4.3 of this Operating Standard for policy on manned extinguishers (OS 2575.2000 4.1).

Notes and Best Practices: Never use a rubber stopper when repair welding is required on the inlet or outlet connections of the fitting being stopped. Count the number of turns required to fully close a specific gate valve control chamber before performing the procedure. Always monitor pipe pressures before and after dropping a stopper.

Considerations before doing a Tap/Stop:

- Is the pipe a one or two way feed?
- If it is a one way feed, what is the direction of gas flow?
- Exactly how much piping is involved?
- How many customers are on the line?
- What are the pressures in all pipe involved?
- If a bypass is to be run, is it large enough to maintain flow?

Inspection Steps:

1. **Inspect tapping equipment to make sure it is in good operating condition.**
2. **Inspect for proper manufacturers manual.**
3. **Inspect to make sure proper procedures are followed.**
4. **Fire extinguisher is on site during tapping and stopping procedure.**
5. **Fitting is soaped out once completed.**
6. **Document findings in QM database.**
7. **Note any deviations, if deviations are found, call area superintendent and email report to all on the QM deviation list.**

Inspection Item: CP Requirements

Pertains to:

Cathodic protection requirements such as exposed pipe inspection, taking PSP reads, anode installation, thermite welds, test station and lead installations. Anode installations for locate wire are audited under the inspection item for Locate Wire.

Calculation of points:

One point maximum for each pipe condition requirement/inspection.

Inspection Checks:

- Except as provided in section 4.5.2.3, each repair fitting installed for a corrosion leak repair on unprotected bare-steel pipe and each new steel fitting installed or pipe welded on unprotected bare-steel pipe shall have a 32-pound anode installed (OS 2600.2000 sec 4.5.2).
- PSP readings shall be taken as soon as possible after exposing steel pipe (OS
- 2575.2800 sec 3.1.2).
- Procedures followed when taking PSP reads (GFP 4515.1210 and GFP 4515.1205).
- The requirements of this section (Examination of buried steel pipe when
- exposed) shall be performed and recorded on the Exposed Pipe Condition Report as soon as possible after exposing steel pipe (OS 2575.2800 sec 3.3).
- If corrosion is found on cathodically protected wrapped pipe, the Manager Gas System
- Integrity shall be notified immediately, before pipe is wrapped and the excavation is backfilled (OS 2575.2800 sec 3.1.3).
- Personnel who remove a pipe segment shall be responsible for ensuring the pipe is inspected (internal corrosion) and completing an “Exposed Pipe Condition Report” (OS 2600.1700 sec 7.1).
- If internal corrosion beyond surface rust is found, the Manger Gas System Control shall be notified immediately of the condition prior to backfilling the excavation (OS 2600.1700 sec 4.2).
- Where PE main is extended from steel main a test lead is installed on the steel main and
- brought to the surface (OS 2600.1200 table 4-1 and OS 2525.2300 sec 5.2). Note: refer to the Inspection Item “Locate Wire” for inspection of the locate (tracer) wire.
- Test leads attached to steel pipe by thermite weld (OS 2600.1200 sec 5.1.1.1).
- Installed second backup wire (OS 2600.1200 sec 5.1).
- Allow enough extra wire to extend leads 18” outside of the box (GFP 4510.1020 pg. 2 step 4).
- Test leads shall be terminated only in a CP test box not in any valve box. 2600.1200 sec 5.2).
- CP test boxes shall be located outside of vehicular traffic areas if at all possible (OS 2600.1200 sec 5.2.3).
- Procedures followed when bonding conductors to steel or pipe (GFP 4510.1040).
- Hot Spot protection installed for corrosion leak repairs on unprotected bare steel pipes (OS 2600.2000 sec 4.5.2).
- Isolated steel services or riser have an anode installed (GFP 4510.1000 fig 7).
- Anode leads brought up in a CP test box shall be labeled with an “A” tag (OS 2600.2000 sec 4.2).
- Anode shall be placed at or below pipe depth, and at least 6 inches away from the pipe (OS 2600.2000 sec 3.1).
- Isolated steel wrapped services allowed to remain after construction shall be cathodically protected and assigned a test site number (OS 2525.2100 sec 4.6.1).
- Cut and capped steel service not retired at main has test station installed near the end (GFP 4510.1000 pg. 10 of 14 fig 6 & OS 2600.1200 pg. 2 of 3 table 4-1).
- Procedures followed when installing CP test stations (GFP 4510.1020).

- CP test box lid painted white (GFP 4510.1020 page 2 step 6).

- An insulated fitting is required immediately downstream of the inside shut off valve (OS 2550.1900 sec 4.4.3).
- A Cathodic protection of the new or repaired tracer wire shall have a PSP read of less than -0.5V. (OS 2600.2000 sec 4.4.3.2).

Notes and Best Practices: For anode installations, do not remove or damage the cloth bag and do not lift the anode by the wire. (GFP 4510.1000)

Inspection Steps:

1. **Were psp reads taken when main is exposed & when job is completed.**
2. **Inspection of existing main completed per GOS.**
3. **Proper anode or test leads installed per GOS and GFP.**
4. **Test leads tagged properly and extend out of wire box per GOS.**
5. **Document findings in QM database.**
6. **Note any deviations, if deviations are found, call area superintendent and email report to all on the QM deviation list.**

Inspection Item: Coatings on Buried Pipe

Pertains to:

The field application of coatings for external corrosion protection of gas piping.

Calculation of points:

One inspection point for each 10' segment of pipe inspected on site.

Inspection Checks:

- Be applied on a properly prepared surface (OS 2600.1100 sec 4.1.1).
- Have sufficient adhesion to the metal surface to effectively resist under film migration of moisture (OS 2600.1100 sec 4.1.2).
- Pipe is properly cleaned and prepared (GFP 4510.1100 pg. 3 and GFP 4510.1110 pg. 2).
- When applying cold-applied pipe tape the edges of the existing pipe coating are feathered and the existing coating is abraded 3 to 4 inches from the coating edge (GFP 4510.1100 pg. 3 step 2).
- Verify tape primer is applied overlapping the original coating 3 to 4 inches and allowed to dry until tacky to the touch (GFP 4510.1100 pg. 5 step 4).
- Tape applied with minimum ½ inch overlap GFP 4510.1100 pg. 5 step 4).
- Vertical above ground pipe taped directionally from bottom to top to shed water (GFP 4510.1100 pg. 5 step 5).
- When used in combination with mastic, tape shall be applied prior to the application of mastic on irregular fittings (GFP 4510.1100 pg. 4).
- When installing pipe, prior to lowering pipe into ditch, all external protective coatings shall be visually inspected (OS 2525.2700 sec 7.5.2).
- Before applying mastic, oil/grease removed with solvent and cleaned metal allowed to dry thoroughly (GFP 4510.1110 pg. 2, step 4).
- Applying cold- applied Mastic (GFP 4510.1110 pg.2).
- Applying Wax tape (GFP 4510.1130)
- All piping to and from vault is wrapped up to the first fitting inside the vault (OS 2600.1100 sec 6.1).
- All piping components in vault are coated with approved corrosion resistant coating (OS 2600.1100 sec 6.2).
- Procedures followed when installing heat- shrinkable sleeves (GFP 4510.1010).
- Person installing sleeve has certification card from the manufacturer or their representative the specific sleeve type (GFP 4510.1010 pg. 1).
- Sleeves only used on steel pipe coated with fusion bond epoxy, polyethylene, or urethane (GFP 4510.1010 pg. 1).
- Sleeve overlaps the existing coatings by a minimum of 2" (GFP 4510.1010 Fig. 3).
- Completed sleeve visually inspected to ensure the sleeve adhesive, which bonds to the coating and extrudes at all shrink sleeve overlaps (GFP 4510.1010 pg. 5 step 1).
- Sleeve that fails inspection is never repaired but only replaced (GFP 4510.1010 pg. 5).
- When tying in a transition fitting to existing bare steel main, the main shall be wrapped for a minimum of 1 foot from the transition fitting and the wrap shall overlap the coating on the fitting by at least 3 inches (OS 2600.1100 sec 5.5).
- When installing wrapped steel fittings or pipe (such as service tees, couplings, and repair clamps) on existing bare steel main, the main shall be wrapped for a minimum of 1 foot on either side of the fitting (OS 2600.1100 sec 5.4).
- On bare steel pipe ensured all portions of the cleaned pipe are covered per the Procedures (GFP 4510.1100).
- See waivers for Solvents / Degreasers and Cleaners.

Inspection Steps:

1. **Existing pipe cleaned per GFP's.**
2. **Wrap installed per GFP.**
3. **Inspect final wrap to make sure GFP requirements are met.**
4. **Document findings in QM database.**
5. **Note any deviations, if deviations are found, call area superintendent and email report to all on the QM deviation list.**

Inspection Item: Compaction

Pertains to:

Inspecting the process of compacting the backfill material.

Calculation of points:

Compaction points are calculated using the 100' rule. One point for all compaction along 100 lineal feet of trench. Each additional 100' section inspected counts as an additional point.

Inspection Checks:

- Back fill material shall be compacted in lifts thick enough to prevent damage to the pipe. If the trench is wide enough, the spaces to the sides of the pipe shall first be compacted (OS 2525.1800 sec 6.3).
- When compaction is performed by powered hand-operated equipment (e.g. big foot, jumping jack), the initial backfill lift over the pipe shall be a minimum of 12” (OS 2525.1800 sec 6.2.2).
- When compaction is performed by machine operated equipment (e.g. hoe-pack, hydro- hammer), the initial backfill lift over the pipe shall be a minimum of 24” (OS 2525.1800 sec 6.2.3).
- All backfill shall be consolidated according to the terms of applicable permits and right of way agreements (OS 2525.1800 sec 6.1.1).
- Undercutting of paving shall be limited to 12” (OS 2525.1700 sec 5.6.1).

Notes and Best Practices: When walking over compacted soil or patches check for softness or pumping. Pumping soil should be checked as unsatisfactory under this inspection item. When observing backfill being compacted, the crew must take care to avoid damage to the buried gas facilities and other underground lines. Also care must be taken when compacting around service and branch connections and points of transition between PE and steel to insure well- compacted support and to protect the pipe and fittings from excessive external loads.

If a temporary patch or final asphalt on hard surface area is sunken or coming apart due to spongy final backfill then the deviation should be captured as "Compaction". This is because the primary cause of the problem can be attributed to failure to have properly compacted final backfill underneath the temporary patch.

If the cold mix in a temporary patch is being kicked from the area by vehicles, but the ground under a temporary patch site appears firm and well compacted, the problem should be captured as "Restoration". This is because properly installing cold mix as a temporary patch is part of restoration on the job. The expectation is that the temporary patch should last until the permanent asphalt is in place.

Inspection Steps:

1. **If crew on site - Inspect if Compaction is completed per GOS requirements (proper equipment/in lifts/suitable material).**
2. **Post inspects, patches are flush with existing hard surface.**
3. **Check for settlement where service or main had excavations.**
4. **Check for proper distance between edge of hard surface and new valve box installation.**
5. **Confirm that crew did not undercut paving more than 12”.**
6. **Document findings in QM database.**
7. **Note any deviations, if deviations are found, call area superintendent and email report to all on the QM deviation list.**

Inspection Item: Pipe – General Installation/Retirement Requirement

Pertains to:

Various requirements, such as branching mains, bridge and vault installations, pipeline markers, weak link, radius bend and retirement requirements.

Calculation of points:

One point maximum for inspection pertaining to general installation/retirement requirements.

Inspection Checks:

- If the pipeline is not going to be placed into service immediately, the system shall be fitted with a gauge and left pressurized with air at or below 60 psi (OS 2525.3300 sec 3.7).
- The riser shall be installed in a way to ensure that the PE service does not support any external loads (OS 2525.1200 sec 6.2.1).
- Branch connections are installed using tees specified in standards (OS 2525.1200 sec 5.2 and 5.2.1)
- Main wraps around the end of cul-de-sac approximately 3 feet beyond the proposed meter location of the last house to be served unless the last house can be twinned (OS 2525.1300 sec 4.5.2 and figure 4.1)
- Main shall be 2 inch diameter and larger, except as noted in Standards (OS 2525.1300 sec 5.3).
- Mains and services shall not be installed under concrete slabs adjoining a manufactured/mobile home or recreation vehicles foundation w/o approval from Manager Standards (OS 2525.3100 sec 2.3 and 4.2.1).
- PE pipe shall not be installed in vaults or any other below ground enclosure (OS 2525.1200 sec 6.5.)
- Where pipe extends through the vault wall, provision must be made to prevent passage of gases or liquids through the opening and to avert strains in the pipe (OS 2525.3200 sec .3.3).
- All hangers used to support exposed pipelines (bridge crossings, etc.) shall be selected that the hanger is not directly welded to the pipe and such that the hanger completely supports the pipe and secures it from lateral movement (2525.2400 sec 3.2.1see 2525.2400 table 4.1 for sizing and spacing).
- Free expansion and contraction of the pipeline between supports or anchors is not restricted (OS 2525.2400 sec 3.3.1).
- When steel piping is supported or anchored, the carrier pipe shall be insulated from the support or anchor (OS 2525.2400 sec 3.4 and 2600.1400 section 4).
- Pipeline marker and warning sign locations and requirements followed as specified in the Standards (OS 2525.2500 section 4 and class table 4.1).
- Before installation, the field crew shall verify the accuracy of the designed marker locations and adjust the locations as needed. In addition the crew shall install additional markers if in their judgment they are required or advised (OS 2525.2500 sec 3.4).
- One-Call Center notified and locates requested (OS 2425.1600 sec 3.3).
- Trench bottom shall be evenly graded to provide firm support along the entire length of the pipeline (OS 2525.1700 sec 5.3).
- Used approved weak link when pulling PE pipe by mechanical means (OS 2525.1200 sec 6.13 and OS 2525.2200 table 9.2).
- PE damage greater than 10% identified and removed (OS 2525.1200 sec 9.3.1).
- Curbs and/or gutters in the public right-of-way shall be installed if they are planned by the developer or required by the permitting agency, and roads shall have a compacted rock base. (OS 2525.1700 sec 4.1.1.1.2).
- All excavated materials shall be removed and temporary steel plating or paving shall be provided and maintained at pavement openings at all times that work is not in progress (OS 2525.1700 sec 5.6.3).
- JT gas facilities located on the roadside of the trench (OS 2525.1500 sec 4.2).
- No metal objects used to maintain separation from other utilities (OS 2525.1200 sec 6.7.2)
- Service deactivated as required in Standards (OS 2525.2100 sec 6 and OS 2525.3600 sec 5 and OS

2525.3650).

- Mains deactivated as required in Standards (OS 2525.2100 sec 5 and OS 2525.3600 sec 4).
- Verify the minimum (long-term) bend radius is not exceeded after the pipe is installed per (OS 2525.1200 sec 10.1).
- When the required bend radius is less than the minimum long term bend radius, butt fusion ells or tees shall be used (OS 2525.1200 sec 10.1.1).
- Techniques for temporary erosion and sediment control (GFP 0150.3200)
- Stabilizer bar on the riser is at 90 degrees (GFP 4575.1030 pg. 2 step 9).
- Prebuilt anode less risers shall be installed such that the “bury line” is visible at or above final grade. (OS 2550.2000 sec 7.4.7)

Notes and Best Practices: In joint trench applications sand bags, staking (plastic or wooden stakes), plastic separators, shading, or other appropriate means may be used to control excessive snaking of the gas pipe. Per S&WP (2001)

Inspection Steps:

1. **When digging up service riser, foot is at 90 degrees.**
2. **Weak link being used when pulling in PE pipe by mechanical means.**
3. **Main and service retirement done per GOS.**
4. **Pipelines not placed into service immediately are left pressurized with a gauge at or below 60 psi.**
5. **Document findings in QM database.**
6. **Note any deviations, if deviations are found, call area superintendent and email report to all on the QM deviation list**

Inspection Item: Materials Handling, Storage and Transportation

Pertains to:

The handling, storage and transportation of materials pertaining to the installation of gas piping.

Calculation of points:

One point maximum for inspection pertaining to materials handling, storage and transportation.

Inspection Checks:

- All steel pipe shall be stored at least 6 inches above the ground.(OS 2450.1400 sec.3.2.1)
- All steel pipe should be stored with one end slightly elevated to aid water drainage. (OS 2450.1400 sec 3.2.2).
- All steel pipe shall be stored such that the supports are spaced to keep the pipe straight, parallel, and without a downward center bow. (OS 2450.1400 sec. 3.2.3).
- When storing, handling, and transporting steel pipe (including transportation by crew trucks), be careful to maintain the pipe's integrity and ensure it is suitable for installation. (OS 2450.1400 sec. 3.1).
- Steel pipe stored horizontally shall meet the requirements of (OS 2450.1400 sec. 3.2 and sec. 4).
- Any pipe laid along a ditch line shall be laid on burlap sacks, wooden blocks, or other suitable supports to protect the coating from rocks or sharp objects. (OS 2450.1400 sec.4.4.1).
- Coated pipe shall be unloaded and set into place in the field by means that will not disturb the coating. (OS 2450.1400 sec. 5.3.1).
- Transportation of pipe from PSE facilities by PSE or contractor to another site shall be accomplished in accordance with the purchase specification for that type of pipe and coating. (OS 2450.1400 sec. 6.2.1).
- Any damage to the pipe or coating incurred during the transport by the contractor is the contractor's responsibility. (OS 2450.1400 sec. 6.2.2).
- Pipe shall not be dragged from a parked or moving vehicle. (OS 2450.1400 sec. 5.3.2).
- Any pipe stored along a high voltage power line right of way should be grounded on one end only with a minimum #14 copper wire to prevent the buildup of static electricity. (OS 2450.1400 sec.4.4.3).

Inspection Steps:

1. **Pipe stored at job site per GOS.**
2. **Proper equipment used to handle and transport pipe. Slings or clamps used so coating is not damaged.**
3. **Crew members not walking or stepping on installed pipe unless necessary.**
4. **Document findings in QM database.**
5. **Note any deviations, if deviations are found, call area superintendent and email report to all on the QM deviation list.**

High Pressure Inspection

Inspection Item: Job Site Materials Inspected

Pertains to:

The inspection of materials to be used on job site, such as pipe, fittings, flanges and bolts.

Calculation of points:

One point maximum for inspection pertaining to job site materials inspected.

Inspection Checks:

- Each flange or flange accessory shall meet the minimum requirements of ASME B16.5, MSS SP-44, or the equivalent. (OS 2450.1000 sec. 7.1).
- Each flange assembly shall be able to withstand the maximum pressure at which the pipeline is to be operated, and to maintain its physical and chemical properties at any temperature to which it is anticipated that it might be subjected in service. (OS 2450.1000 sec. 7.2).
- Each steel butt-welding fitting shall have pressure and temperature ratings based on stresses for pipe of the same or equivalent material. (OS 2450.1000 sec.8.2).
- All pipeline components shall meet the requirements of this Operating Standard and the appropriate written specifications. (OS 2450.1000 sec. 3.1).
- When close all-thread nipples are used, the wall thickness remaining after the threads are cut shall meet the minimum wall thickness requirements of Operating Standard 2525.1100. (OS 2450.1000 sec 4.4)

Inspection Steps:

1. **Steel pipe received at the job site shall be inspected for pipe grade, wall thickness, bevel, coating condition, coating thickness and overall condition of pipe.**
2. **Confirm fittings and pipe is appropriate for the job to be installed.**
3. **Does the fitting to be welded to a weld o let require taper boring?**
4. **Document findings in QM database.**
5. **Note any deviations, if deviations are found, call area superintendent and email report to all on the QM deviation list.**

Inspection Item: Correct Weld Procedure Used

Pertains to:

The inspection of the correct weld procedure being used.

Calculation of points:

One point maximum for each correct weld procedure used.

Inspection Checks:

- Identify welding type (e.g., butt weld or fillet weld). (4900.1200)
- Identify welding method (e.g., arc, oxyacetylene, et cetera). (4900.1200)
- Identify pipe size, grade, wall thickness, and fitting size (if necessary). (4900.1200)
- When joining pipe of two different grades, use the procedure for the higher grade. (4900.1200)

Inspection Steps:

1. **Confirm that welder knows the procedure that is to be used.**
2. **Proper filler metal is being used.**
3. **Pre heating is done if applicable.**
4. **Document findings in QM database.**
5. **Note any deviations, if deviations are found, call area superintendent and email report to all on the QM deviation list.**

Inspection Item: Welds

Pertains to: The visual inspection of completed welds.
Calculation of points: One point maximum for each weld that is visually inspected.
Inspection Checks:

- Qualified inspectors shall periodically inspect the condition of pipe and components and the quality of the installation and welding of steel piping. Inspection shall ensure that all work conforms to PSE Operating Standards. (OS 2525.2700 sec. 7.1).
- Weld inspection, and repair or removal of unacceptable welds, shall meet the requirements of Welding Standard 2700.1200. (OS 2525.2700 sec. 7.2).
- If a production weld is not satisfactory, three additional production welds shall be cut out and tested within the next 10 working days. If any of the three welds are not satisfactory, the welder must demonstrate additional training acceptable to the Company and must be re qualified by passing the appropriate welding test. (OS 2525.2700 sec. 7.3).
- During production welding, the Company's authorized representative may request immediate re qualification or disqualification of any welder who produces unacceptable welds or does not demonstrate the necessary welding skills, even though the welder's qualifications may be current. (OS 2525.2700 sec. 7.4).
- All Company facilities shall be inspected before backfilling, or being placed into service for aboveground facilities, to ensure that they are constructed in accordance with this Operating Standard. (OS 2525.2700 sec. 7.5).
- Each length of pipe and all components shall be inspected at the installation site immediately before placement into the ditch to ensure that there is no visually determinable damage that could impair its serviceability. (OS 2525.2700 sec. 7.5.1).
- Each imperfection or damage that impairs the serviceability of a length of steel pipe shall be removed unless an acceptable repair is reviewed and approved by the Manager Standards and Manager Engineering to ensure all regulatory requirements are met. Welds shall be repaired in accordance with Welding Standard 2700.1200. (OS 2525.2700 sec.7.5.1.1).

Inspection Steps:

1. **Visual inspection shall be conducted on every weld to ensure that the welding is performed in accordance with the welding procedures included in the Field Procedures manual.**
2. **The welds shall meet the standards of acceptability for visual inspection as specified in API Standard 1104 as determined by weld inspectors qualified in accordance with Operating Standard 2700.1300.**
3. **Nondestructive testing of welds shall be performed in accordance with written procedures and by persons who have been trained and qualified in the established procedures and with the equipment employed in testing.**
4. **Radiographically examined welds shall meet the standards of acceptability of API Standard 1104.**
5. **Pipelines designed to operate at a pressure which produces a hoop stress of 20% or more of the specified minimum yield strength (SMYS) shall be radiographically examined in addition to visual inspection.**
6. **Document findings in QM database.**
7. **Note any deviations, if deviations are found, call area superintendent and email report to all on the QM deviation list.**

Inspection Item: Bending Steel Pipe

Pertains to:

The bending of steel pipe.

Calculation of points:

One point maximum for each steel pipe bend that is visually inspected.

Inspection Checks:

- A bend shall not impair the serviceability of the pipe. (OS 2525.2700 sec.5.1).
- Field bending of steel pipe shall be accomplished by a cold bending method that produces a smooth, uniform contour with a minimum radius in accordance with Table 5-1. (OS 2525.2700 sec. 5.2).
- Ovality of steel pipe after bending shall be calculated according to the following formula: Ovality (%) = {[(Max. OD) -- (Min. OD)] (Nominal OD)} x 100. (OS 2525.2700 sec. 5.3).
- The ovality at the pipe ends shall be less than 2.5 %.(OS 2525.2700 sec.5.3.1).
- The ovality over the entire pipe shall be less than 5 %.(OS 2525.2700 sec. 5.3.2).
- The pipe shall be free from buckling, cracks, or any other mechanical damage and shall conform after bending to the profile of the completed ditch. (OS 2525.2700 sec. 5.4).
- There shall be no wrinkle bends or mitered bends, except deflections up to 3 degrees that are caused by misalignment are allowed. (OS 2525.2700 sec. 5.5).
- Pipe bends shall not be made within one and one-half pipe diameters of a circumferential weld. Refer to Welding Standard 2700.1200 for nondestructive testing requirements of welds in proximity to bends. (OS 2525.2700 sec.5.7).
- Steel pipe shall not be bent within 5 feet of the end of the pipe segment being bent. (OS 2525.2700 sec. 5.8).
- If pipe contains a longitudinal weld, the weld shall be as near as practicable to the neutral axis of the bend (see Figure 5-1), unless the bend is made with an internal bending mandrel; or the pipe is 12 inches or less in outside diameter or has a diameter to wall thickness ratio less than 70.(OS 2525.2700 sec. 5.9).

Inspection Steps:

1. **Confirm proper bending shoes are being used for the size of pipe being installed.**
2. **Pipe seam is located on the pipe and oriented to the neutral axis.**
3. **Bend is not made within 5 feet of the end of a pipe segment.**
4. **Check ovality and for wrinkles.**
5. **Does the bended pipe fit the ditch without undue stress?**
6. **Did the bend engineer use the proper procedure?**
7. **Document findings in QM database.**
8. **Note any deviations, if deviations are found, call area superintendent and email report to all on the QM deviation list.**

Inspection Item: Jeeping

Pertains to:

Jeeping the coating on wrapped steel pipe.

Calculation of points:

One point maximum for each section of piping that is jeeped.

Inspection Checks:

- Bent pipe shall be visually and electronically inspected ("jeeped") in the same manner as straight joints. Jeeping shall be done in accordance with Field Procedure 4515.1400.
- External coatings on newly installed steel pipe 2 inches in diameter or greater shall be electronically inspected (jeeped) in accordance with Field Procedure 4515.1400. (OS 2525.2700 sec. 7.5.2.1).
- This requirement applies to pipe and butt welded pipe joints (including final tie-in joints).
- All detected coating defects ("holidays") shall be repaired. (OS 2525.2700 sec. 7.5.2.1.1).
- Coating repairs shall be jeeped after completion of the repair. (OS 2525.2700 sec.7.5.2.1.2).

Inspection Steps:

1. **Review jeeping procedure (GFP 4515.1400) with personnel responsible for wrapping pipe.**
2. **Jeeping of pipe in all bell holes is required.**
3. **Pipe shall not be left unshaded overnight. If it is, the pipe will need to be jeeped the following day. Or rock shield used.**
4. **Proper grounding of the jeep machine will be required.**
5. **If repairs are made to the pipe coating, all repairs will be re-jeeped.**
6. **Crew shall be responsible to check voltage every day.**
7. **Document findings in QM database.**
8. **Note any deviations, if deviations are found, call area superintendent and email report to all on the QM deviation list.**

Inspection Item: Testing

Pertains to:

The testing of High Pressure piping.

Calculation of points:

One point maximum for each pipe segment that is tested.

Inspection Checks:

- The Manager Engineering, or their designee, shall be responsible for developing written procedures for all tests for pipelines, except for service lines, designed to operate above 60 psig. (OS 2525.3300 sec. 2.1.1).
- Approving test results on pipelines, except for service lines, designed to operate above 60 psig. (OS 2525.3300 sec 2.1.2).
- All new, relocated, replaced, or temporarily abandoned pipelines shall be tested before being placed in service in accordance with the provisions of this Operating Standard.(OS 2525.3300 sec. 3.1)
- All leak and strength tests shall be performed on pipe after it has been installed, and backfilled, at a minimum, with initial backfill as specified in Operating Standard 2525.1800,except as allowed in Section 3.1.2.(OS 2525.3300 sec. 3.1.1).
- Pipeline repairs and certain fabricated units and short sections of pipe (such as valve sections and purge connections) may be tested prior to installation and/or backfill as applicable. (OS 2525.3300 sec. 3.1.2).
- A preliminary leak test shall be conducted at a pressure between 100 psig and 150 psig or the pressure that produces a hoop stress of less than 20%, whichever is less. (OS 2525.3300 sec.6.5.1).
- The preliminary leak test pressure shall be maintained for 15 minutes. (OS 2525.3300 sec. 6.5.1.1).
- All exposed piping shall be tested with soap suds during the test period. (OS 2525.3300 sec. 6.5.1.2).
- The gauge pressure shall not drop during the test period, unless the test is instrumented for temperature and approved by the Manager Engineering. (OS 2525.3300 sec.6.5.1.3).
- Except as required in Section 6.5.5, when air, nitrogen, or natural gas is used as the test medium, the test pressure shall be maintained for the minimum period of time listed in Table6-1, unless otherwise indicated in the written procedure. In no case shall the test duration be less than 1 hour. (OS 2525.3300 Table 6-1).
- Each length of pipe used to tie-in a test segment shall be made from pretested pipe. (OS 2525.3300 sec. 6.7).
- Each joint used to tie-in a test segment shall be leak tested with soap suds at the operating pressure when placed into service.(OS 2525.3300 sec.6.9)

Strength Test Requirements:

The test pressure shall be at least 1.5 times the proposed pipeline MAOP and shall be maintained for a minimum period of 24 hours unless otherwise indicated in the written procedure (the written procedure shall not specify test duration less than 8 hours) or as allowed in Section 7.6.4. (OS 2525.3300 sec.7.6.1).

Deadweight pressure readings shall be taken at one hour intervals.

Temperature readings shall be taken from thermocouples installed on the pipeline as shown on the design drawings. During the test period, temperature data provided by the thermocouples shall be recorded at the same regular intervals as the pressure readings. (OS 2525.3300 sec. 7.6.3)

Inspection Steps:

1. **Review testing procedures**
2. **Check installation of thermocouples.**
3. **During tests, assure all exposed fittings are soap tested**
4. **Check with PSE Pressure Control on test results**
5. **After tests are approved, assure the test pressure has been reduced or blown down flat, per GOS 2525.3300.**
6. **Document findings in QM database.**
7. **Note any deviations, if deviations are found, call area superintendent and email report to all on the QM deviation list.**

Inspection Item: Pigging

Pertains to:
Pigging segments of pipeline.

Calculation of points:
One point maximum for each segment of piping that is pigged.

Inspection Checks:

- Keep the line free of debris during construction. If the main is 4 inches or larger in diameter and greater than 100 feet in length, the pipe shall be pigged to clean out the line prior to placing it in service. (OS 2525.2700 sec. 3.11)
- When the pipeline is designed to accommodate pigging, all 3R fittings (or transverse segments of 3Rfittings) shall be installed with a minimum of 3 feet of separation between the 3R fitting (or transverse segments of 3R fittings), unless otherwise approved by the Manager Engineering. (OS 2525.2700 sec.3.16).
- Except as provided in Sections 6.2 and 6.3, each new transmission line and each replacement of line pipe, valve, fitting, or other line component in a transmission line must be designed and constructed to accommodate the passage of instrumented internal inspection devices. (OS 2525.1100 sec. 6.1).
- Per HP job procedures, if hydrostatic testing is required, follow written procedures for de- watering piping.

Inspection Steps:

1. **Confirm proper pig is being used for each application.**
2. **When running any type of brush pig, a pig catcher that is welded to the pipe is required.**
3. **Make sure pig(s) have been installed at end of header.**
4. **Verify the completion of pigging the gas main.**
5. **Verify dewatering has been completed per written procedure.**
6. **Document findings in QM database.**
7. **Note any deviations, if deviations are found, call area superintendent and email report to all on the QM deviation list.**

Inspection Item: Trench Requirements

Pertains to:
Job site trenching requirements.

Calculation of points:
One point maximum for each trench requirement inspected.

Inspection Checks:

- 3.5 Each external protective coating shall be protected from damage resulting from adverse ditch conditions or damage from supporting blocks. (OS 2525.2700 sec. 3.5).
- When installed in the ditch, the pipe shall be placed so that it fits the ditch without the use of external force to hold it in place. (OS 2525.2700 sec. 3.7).
- Each pipeline and related facilities shall have sufficient support to: Prevent undue strain on connected equipment and not be supported by other piping; Resist longitudinal forces caused by a bend or offset in the pipe; and, Prevent or damp out excessive vibration. (OS 2525.2400 sec.3.1).

Inspection Steps:

1. **Ditch is wide enough to accommodate pipe without undue stress.**
2. **If ditch is over 4 feet deep, shoring is installed.**
3. **Pipe is properly supported if ditch is over dug.**
4. **Sandbags used to support the pipe off of the bottom of the ditch.**
5. **Ditch is wide enough to allow initial backfill to flow underneath the bottom of the pipe.**
6. **Inspect trench for safety requirements.**
7. **Trench is clear of rocks or any other items that may damage the pipe or pipe coating.**
8. **Document findings in QM database.**
9. **Note any deviations, if deviations are found, call area superintendent and email report to all on the QM deviation list.**

Inspection Item: Preventing Accidental Ignition

Pertains to:
The prevention of accidental ignition.

Calculation of points:
One point maximum for each inspection.

Inspection Checks:

- Bonding cables shall be firmly attached to both sides before steel pipe is cut or reconnected. (OS 2575.2000 sec. 3.5).
- Repairs involving flame cutting of pipe shall be made in a gas free atmosphere. (OS 2575.2000 sec. 3.4.1).
- Prior to welding, cutting, or other hot work in or around a structure, area, or facility containing gas, a check shall be made for the presence of gas. Work shall begin only when safe conditions are present. (OS 2575.2000 sec. 3.3.1).
- Whenever purging, venting, or aspirating operations are taking place; ensure that the venting stream is directed up and away from traffic, pedestrians, and potential sources of ignition; and ensure that the vent stack is secured in place. (OS 2575.2000 sec.3.2.1).
- Gas or electric welding or cutting shall not be performed on pipe or pipe components that contain a combustible mixture of gas and air in the area of work. This includes pipe not under pressure that contains gas. (OS 2575.2000 sec. 3.3).
- When a hazardous amount of gas is being vented into open air, or the work process could result in an uncontrolled release of gas, such as welding, fusing, squeezing or tapping on live gas, at least one fire extinguisher shall be available at the work site. (OS 2575.2000 4.1).
- The fire extinguisher shall be removed from the vehicle, inspected for serviceability, and placed upwind of the work site in a location where it is available for immediate use. (OS 2575.2000 4.1.2).
- When there is a controlled release of gas, a manned fire extinguisher is required any time the control valve is 2 inches or larger. (OS 2575.2000 sec. 4.3.4).
- A fire extinguisher shall be adequately sized and fully charged and current in accordance with the PSE employee Safety and Health Program (OS 2575.2000 sec 4.1.1)

Inspection Steps:

1. **Inspect area to check for potential ignition sources.**
2. **When work tasks are being performed, check for fire extinguisher requirement.**
3. **Bonding cables used when required.**
4. **Fire extinguishers on site and available.**
5. **Document findings on QM database.**
6. **Note any deviations, if deviations are found call area superintendent and email all on the QM deviation list.**

Inspection Item: Main Valve

Pertains to:
The inspection of main valve installation.

Calculation of points:
One point maximum for each main valve inspected.

Inspection Checks:

- Buried valves shall be installed with an approved valve box and lid such that the lid is visible and flush with the existing ground surface. (OS 2525.2600 sec. 3.4.3).
- If a valve is installed in a buried box or enclosure, the box or enclosure shall be installed so as to avoid transmitting external loads to the main. (OS 2525.2600 sec. 3.5).
- Valves shall not be installed in inaccessible locations. (OS 2525.2600 sec. 3.6.3.1).
- High pressure block valves shall be supported to prevent settling of the valve or movement of the pipe to which it is attached. See standard concrete valve support design for more information on designing concrete valve supports. (OS 2525.2600 sec. 5.6).
- Each high pressure main and transmission line shall have sectionalizing block valves. (OS 2525.2600 sec. 5.1).
- High pressure block valves should be installed at intervals: Not to exceed one mile, if practical, but at no time shall the interval be more than two miles unless the pipeline is installed in a sparsely populated area. (OS 2525.2600 sec. 5).
- Not to exceed five miles for pipelines installed in sparsely populated areas. The primary objective is to locate valves in these areas to maximize accessibility. (OS 2525.2600 sec. 5).

Inspection Steps:

1. **Verify ANSI pressure class rating is correct on the tag and on the valve body.**
2. **Valve is correct type and design based on the job site prints.**
3. **Confirm with Pressure Control that the valve has the correct number of turns on the operator.**
4. **Prior to installation, HP valves greased by Pressure Control.**
5. **Valve installed per design or GOS requirements.**
6. **Valve supported as required.**
7. **Valve box & grease fittings installed per requirements.**
8. **Lids painted proper color.**
9. **Document findings in QM database.**
10. **Note any deviations, if deviations are found call area superintendent and email all on the QM deviation list.**

Inspection Item: Boring

Pertains to:
Boring or trenchless installations.

Calculation of points:
One point for each inspection.

Inspection Checks:

- If coated pipe is installed by boring, driving, or other similar method, precautions shall be taken to minimize damage to the coating during installation. (OS 2525.2700 sec.3.6).
- Construction shall be conducted in such a manner as to minimize damage to shorelines, wetlands, recreational areas, adjacent structures, public rights-of-way, and fish and wildlife habitats. (OS 2525.2200 sec. 5.2).
- All utilities to be crossed shall be located and day lighted prior to drilling where practical. (OS 2525.2200 sec. 5.4).
- The minimum radius of curvature for steel carrier pipe shall be in accordance with Table 6-1. (OS 2525.2200 sec. 6.2.9).
- Measurements shall be taken a minimum of every 30 feet of drill pipe during the pilot hole drilling process, except as specified in Sections 6.4.1 and 6.4.2. (OS 2525.2200).
- A reamer shall be attached to the drill pipe and a swivel shall be attached between the reamer and pipeline pull head to ensure the hole remains open and no rotational torque is applied to the pipeline during pullback. (OS 2525.2200 sec. 9.1).
- Cathodic protection shall be installed in accordance with Operating Standard 2600.1300 to ensure continuity. (OS 2525.2200 sec. 9.4).
- The pullback section shall be supported so that it moves freely with minimal drag and the pipe wall/coating is protected from damage. (OS 2525.2200 sec. 9.6).
- The leading end of all pullback sections shall be plugged to prevent entry of drilling fluid or other debris. (OS 2525.2200 sec. 9.7).
- Protective devices shall be used as appropriate to prevent pipeline damage from the edges of the pit at entry during pullback. (OS 2525.2200 sec. 9.8).
- The pullback forces in Tables 9-1 and 9-2 shall not be exceeded unless approved by the Manager Engineering. The Manager Engineering shall approve the maximum pullback force for pipe sizes, wall thicknesses, and grades that are not listed in Tables 9-1 or 9-2. (OS 2525.2200).

Inspection Steps:

1. **Proper staking completed before drilling (entry & exit points).**
2. **Drilling at proper angles for pipe to be installed**
3. **Proper back rimming preformed**
4. **Swivel head installed on bore rod before pull back.**
5. **All welds X-rayed prior to pull back.**
6. **Pipe tested per GOS requirements.**
7. **Shrink sleeved installed on steel wrap pipe, 5' back from pull head.**
8. **PE pipe to have weak link installed.**
9. **Steel wrap pipe to be jeeped as pipe in being pulled back.**
10. **Pipe coating to be checked and has acceptable current, performed by Corrosion Control.**
11. **Document findings in QM database.**
12. **Note any deviations, if deviations are found call area superintendent and email all on the QM deviation list.**

Inspection Item: Guard Post

This inspection item can be found in the Site Audit portion of the manual under the heading:
Exposed Facility Protected