

Appendix A

Additional Olympic Pipe Line Company Procedures

8.3.1 Addition Inspections

Olympic Pipe Line Company has a program of internally inspecting all mainline or lateral lines on a 5 year rotating basis. This "smart pigging" program uses a magnetic flux leak detection tool to detect and record variances in wall thicknesses as it travels the length of the pipeline. The inspection also measures and locates the length of each joint of pipe, each weld, valves, fittings and different wall thicknesses. The variances in the wall thicknesses are graded on a system based on the percentage of metal lost from the original wall thickness. The inspection system is sensitive enough to locate other types of non-corrosion related defects such as mashes, taps, test leads, supports, mill/mechanical anomaly, patches, half soles, debris, and anchors.

The inspection tool measures the distance from the origin launch location in feet and in time, seconds, from launch. The tracking of the inspection tool is done by placing above ground markers along the pipeline route. This provides meaningful markers on the reference survey that are identified to later refer to if excavation is necessary. The current status of Olympic's inspection program is shown below:

PIPELINE SEGMENT	YEAR OF LAST INSPECTION	YEAR OF NEXT INSPECTION
Ferndale Station to Allen Station 16" Allen Station to Renton Station 16" Allen Station to Renton Station 20"	1991	1996
Cherry Point Station to Ferndale Station 16" Anacortes Station to Allen Station 16" Renton Station to Seattle Delivery Facility 12" Renton Station to Sea-Tac Terminal 12" Tacoma Junction to Tacoma Delivery Facility 8" Vancouver Junction to Vancouver Delivery Facility 12" Renton Station to Portland Delivery Facility 14"	1992	1997
Olympia Junction to Olympia Delivery Facility 6"		1993

Olympic Pipe Line will excavate and visually inspect all anomalies that are deeper than 20% of the original wall thickness. If visual inspection does not reveal a defect, then ultrasonic measurement of the pipe wall thickness is performed to determine if the anomaly is internal. If the inspections of the pipeline determine that corrective action is necessary (as defined ANSI B31.4.) the pipeline shall be repaired or replaced.



U.S. Department
of Transportation

**Research and
Special Programs
Administration**

Western Region
Pipeline Safety

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August 9, 2001

Mr. Allan C. Beshore
National Transportation Safety Board
Investigator-in-Charge
490 L'Enfant Plaza East, S.W.
Washington, DC 20594-2000

Re: Pipeline Rupture and Fire, Bellingham, Washington, DCA-99-MP-008

Dear Mr. Beshore:

Enclosed, please find a copy of a compact disk (CD) given to me by Olympic Pipeline Company personnel in late August, 1998, that contains the manuals that were in use by them at that time. I have also enclosed a copy of Mr. Katchmar's response to the Environmental Response draft factual report.

If you have any questions, please do not hesitate to contact Peter Katchmar or myself at (303) 231-5701.

Sincerely,

Chris Hoidal
Director

Enclosures

Purpose

To establish repair and testing procedures for imperfections, damage corrosion and leaks on steel pipelines in accordance with the above D.O.T. regulation.

General

The following general procedures shall be observed:

- At any time a leak, injurious imperfection, damage or injurious corrosion is evident, immediate temporary measures shall be employed to protect the property and public if it is not feasible to make a permanent repair at the time of discovery.
- As soon as feasible, permanent repairs shall be made as described herein.
- Repairs shall be performed under qualified supervision by trained personnel aware of and familiar with the hazard to public safety, utilizing strategically located equipment and repair materials. It is essential that all personnel working on pipeline repairs understand the need for careful planning of the job; be briefed as to the procedure to be followed in accomplishing the repairs; and follow precautionary measures and procedures outlined in API PSD 2200. Personnel working on repairs to pipelines handling HVL shall also be informed of the specific properties, characteristics, and potential hazards associated with this liquid, precautions to be taken following detection of a leak, and safety repair procedures set forth for HVL pipelines in PSD 2200. Approvals, procedures, and special considerations described in API PSD 2200, except those related to electrode diameter, shall be observed for welding, as well as making hot taps on pipelines, vessels, or tanks which are under pressure.
- All welds made on a pipeline shall be made by a welder who has been qualified in accordance with applicable Olympic Procedures (315.B.010 through 315.B.013).

Permanent Repair of Imperfections, Damage, Corrosion, and Leaks

- **Limits and Disposition of Imperfections**
 - Gouges and grooves having a depth greater than 12 1/2 percent of the nominal wall thickness shall be removed or repaired.
 - Dents meeting any of the following conditions shall be removed or repaired:

- Dents which a00g a depth of 1/4 inch (6mm) in pipe NPS 12 and smaller, or 2 percent of the nominal pipe diameter in sizes greater than NPS 12.
- All arc burns shall be removed or repaired.
- All cracks shall be removed or repaired.
- All field welds found to have imperfections that do not meet the acceptability in 195.228 of part 195, Title 49, D.O.T. Regulations shall be removed or repaired.
- All pipe welds found to have imperfections that do not meet the acceptability limits in the appropriate pipe specifications (API 5L, 5LS, or 5LX) for the grade and type of pipe shall be removed or repaired.
- **General Corrosion** - Pipe shall be replaced, or repaired if the area is small, or operated at a reduced pressure if general corrosion has reduced the wall thickness to less than the design thickness calculated in accordance with 404.1.2 of ANSI B31.4 or 195.106(a) of OPLCo Procedure Manual 110.B.016, decreased by an amount equal to the manufacturing tolerance applicable to the pipe or component.
- **Localized Corrosion Pitting** - Pipe shall be repaired, replaced, or operated at a reduced pressure if the sizes of localized corrosion pitting exceeds the allowable pit sizes in Addendum A. The method for calculating reduced pressures is given in ANSI B31.4, Section 451.7.
- Areas where grinding has reduced the remaining wall thickness to less than the design thickness calculated in accordance with 404.1.2 to ANSI B31.4 or 195.106(a) of OPLCo Procedure Manual 110.B.016 decreased by an amount equal to the manufacturing tolerance applicable to the pipe or component, may be analyzed the same as localized corrosion pitting.
- All pipe containing leaks shall be removed or repaired.

- **Allowable Pipeline Repairs**

- If feasible, the pipeline shall be taken out of service and repaired by cutting out a cylindrical piece of pipe containing the imperfection and replacing the same with pipe meeting the requirements of 401.2.2 of ANSI B31.4 and having a length of not less than one-half diameter, or 12", whichever is the longer.

- If not feasible to take the pipeline out of service, repairs may be made by the installation of a full encirclement welded or mechanically applied split sleeve in accordance with Section III.C.
 - For repairs of dents, a filler material such as epoxy shall be used to fill the void between the sleeve and the pipe to restore the original contour of the pipe, or the carrier pipe shall be tapped through the sleeve or other means provided to equalize the internal pressures of the carrier pipe and the sleeve.
 - For repairs to non-leaking cracks, the carrier pipe shall be tapped through the pressure containing sleeve or other means provided to equalize the internal pressures of the carrier pipe and the sleeve.
- If not feasible to take the pipeline out of service, imperfections may be removed by grinding or hot tapping. When grinding, the ground areas shall be smoothly contoured and shall not reduce the thickness to that required in Section III.A.8. When removing an imperfection by the method of hot tapping, the hot tap fitting shall be welded on the pipe such that the portion of pipe containing the imperfection shall be completely removed by the hot tap.
- If not feasible to take the pipeline out of service, minor leaks and small corroded areas may be repaired by the installation of a patch or welded fitting in accordance with Section III.C.2 and III.C.5. Pipe containing arc burn, grooves, and gouges may be repaired with patches or welded fitting if the arc burn or notch is removed by grinding. This repair method not applicable to cracks.
- If not feasible to take the pipe out of service, imperfections in welds produced with a filler metal, small corroded areas, gouges, grooves, and arc burns may be repaired by depositing weld metal in accordance with Section III.C.5. Weld imperfections, arc burns, gouges and grooves shall be removed by grinding prior to depositing the weld filler metal.

- **Repair Methods**

- Temporary repairs may be necessitated for operating purposes and shall be made in a safe manner. Such temporary repairs shall be made permanent or replaced in a permanent manner as described herein as soon as practical.
- Welded patches shall be installed in accordance with Addendum B. The patch material shall be of a similar or higher grade with a wall thickness similar to the pipe being repaired. Patches shall be limited to pipe sizes NPS 12 and less and conforming to API 5LX, Grade X42, and lower. Patches shall be attached by fillet welds. Insert patching is prohibited. Special consideration shall be given to minimize stress concentrations resulting from the repair.

- Full encirclement welded split sleeves shall be installed in accordance with Addendum D and E. Patches on pipe may be enclosed with full encirclement; OD and larger in grades through X60 sleeves in accordance with Addendum F. This applies to pipe sizes 6 5/8" OD and larger in grades through X60.
- Mechanically applied full encirclement repair fittings shall meet the design requirements of 401.2 and 418 of ANSI B31.4.
- For repairs involving only deposition of a weld filler metal, welding processes shall be in accordance with the requirements of the appropriate pipe specification for the grade and type being repaired. Such repairs will be limited to pipe grades X52 and less. Welding procedures shall be in accordance with the appropriate standard procedure specifications approved by the Denver Engineering Department.
- Weld wraps (Addendum E) may be used to repair or reinforce girth welds on existing pipeline within the criteria given in Addendum A.
- Where repairs are made to a coated pipe, all damaged coating shall be removed and new coating applied in accordance with 461.1.2 of ANSI B31.4. Replacement pieces of pipe, welded patches, and full encircled welded split sleeves used in making repairs shall also be coated when installed in a coated line. The coating must be carefully done to ensure no holidays in the vicinity of repair welds.
- Pipe containing liquid shall be examined to determine that the material is sound and of adequate thickness in the areas to be affected by grinding, welding, cutting, or hot tapping operations.
- If the pipeline is not taken out of service, the operating pressure shall be reduced to a level which will provide safety during the repair operations.
- When repair sleeves, weld + ends, weld wraps or full encirclement fittings are not butted and welded together in accordance with Section IIIB of Addendum D, a minimum gap must be maintained between them. This minimum gap should be equal to at least 4 pipe diameters except for weld + ends, weld wraps, full encirclement fitting or repair sleeves less than 4 pipe diameters long installed on straight pipe not subject to ground heaving. In this case, the minimum gap must be the length of the longest adjacent repair sleeve, weld + end, weld wrap or fitting.

Testing

All pipe inserted into a piping system will be pressure tested prior to being put into service to meet all the requirements of Olympic test procedures. Such tests will be recorded on Certification of Pipeline Pressure Test, CO-8482. Records of all tests shall be kept for the life of the facility. Tie-in welds not pressure tested after completion shall be non-destructive tested.

Replacing

When pipe is replaced as a repair project by butt welding, then all the requirements called for in D.O.T. Title 49 Part 195 under design, construction, and testing shall be adhered to. When weld + ends are used to install replacement pipe, the applicable requirements of Addendum D shall be used.

Changes

All changes in location of pipelines, additions or deletions of pipe, lowering of lines, reconditioning pipe, installing coating on non-coated lines, etc, shall be shown on Diagram of Changes Form, CO-7162. Where equal footage of pipe is replaced with same grade and wall thickness as original pipe and has coating equal to the original pipe coating, it need not be reported on a Diagram of Changes; however, a record must be kept of the repairs on Leak, Maintenance and Exposed Pipe Report, Form CO-7740, and Daily Report Radiographic Testing of Pipe Welds, CO-8727, attached to establish a record of the non-destructive testing of the tie-in welds.

Right of Way Surveillance and Pipeline Safety Procedures

The following is an outline of the R.O.W. Surveillance and Safety Program. It is designed to assist supervisors and employees in the importance of thinking and working safety around our pipelines.

1. Olympic Pipeline Company responds to four underground location centers:
 - a) Oregon Utilities Notification Center - Multnomah County, OR
 - b) Northwest Utility Notification Center - Clark County, WA
 - c) Utilities Council of Cowlitz County
 - d) Utilities Underground Locating Center - Whatcom, Skagit, Snohomish, King, Pierce, Thurston and Lewis Counties, WA

2. Following are the eight basic colors used for markings and pre-construction approved by APWA/ULCC:
 - RED... electric/power*
 - YELLOW... gas/oil*
 - ORANGE... telephone/catv*
 - BLUE... water*
 - GREEN... sewer*
 - PURPLE... reclaim water/irrigation*
 - PINK... survey*
 - WHITE... proposed construction*

3. Underground utilities should be staked and/or flagged every 50 feet. One should be able to stand in one place and see the next stake or flag.

4. The location tolerance for locating and marking buried facilities is 24 inches (24" from the outside dimensions of both sides of an underground facility. Hand-digging should be done within this tolerance zone.

5. When marking on hard surfaces (such as a road), a yellow line about 30" long and two inches wide shall be spray-painted, with a pyramid with the letter "O" painted in the middle.

6. With new housing starts or large construction areas, a carsonite type marker should be located at both ends of the project. If you are unable to stand at one end of the project and observe the warning marker at the other end, then additional warning markers will be required between the two end markers.

7. Upon the receipt of a one-call or Action Memo, you have two business days to respond. (See item 23)
8. New roads (including logging roads) shall have a carsonite warning marker installed on both sides of the road.
9. Warning markers within the farming community shall be placed on fence lines, but not in the middle of fields. In open areas such as power line rights-of-way and uncultivated lands, one should be able to stand at a warning marker and see the next two warning markers.
10. Prior to construction, O.P.L. lines will be probed for known depth to top of pipe. If the job is a large one, then the contractor should be made aware that the line(s) need to be pot-holed prior to starting markers.
11. No bores or hogs will be bored across O.P.L. lines without our line being exposed (windowed).
12. "Exposure" means that the line is exposed from top, bottom, and sides for a distance of not less than twelve inches each side.
13. Prior to a crossing of O.P.L. line(s), they will be hand dug until exposed. On hard surfaces such as roads, a chip-hammer or backhoe may be used until the hard crust is broken. At that time, you should probe the line until you are certain you are atop the pipeline.
14. O.P.L. requires a minimum twelve inches of clearance on all utilities that cross over or under our lines.
15. Electric power runs shall be cased in rigid conduit, and buried in "RED CEMENT", with a minimum of twelve inches clearance.
16. Within *franchised areas*, we sometimes face the possibility of not getting our twelve inches of clearance. Try reasoning with the municipality representatives, we can usually get our requirement. If you're not successful, call the Right-of-Way office for assistance.
17. If a contractor is going to bore across our line, and we are windowed: Measure from the edge of his bore pit to the edge of the windowed area of our pipeline. Take that measurement and measure it back from the tip of the bore, and place a piece of tape on the hose. This is going to tell you how close the bore is to your windowed pipe. Bores often times hit a hard object and run in a different direction. If the taped area of the hose is up against the edge of the pit, the bore should have broken through your windowed pipe area. If the bore has not broken the side of the windowed area, have the contractor shut down.

18. It is recommended you to get to know the County underground utility inspectors of the counties within your respective areas-they can save you a lot of grief with a troublesome contractor.
19. Prior to going out on a crossing or a locate, check your line sheets to see where the closest test points are located in your area of concern. Also ensure that you have the basic equipment necessary to make your crossing and/or locate.
20. When talking with property owners, contractors, or developers, be sure to give them a copy of Olympic Pipe Line Company General Right-of-Way Stipulations and Requirements. This will generally answer most or all of their questions.
21. Once on-site for a locate, and the line has been located, check the area for known stationings off your line sheets. If possible, probe your line. If there's a casing vent, you can remove it and check the depth by measuring from the top of the stand pipe to the bottom, and subtracting the difference between the top of the pipe and the known distance to the ground. One thing you have to keep in mind while doing this: If you think the bottom of the stand pipe feels soft, there's a good probability dirt or other debris is within the pipe. This will give you an incorrect reading. If your tape feels like you're on hard surface, chances are you're okay, and within an inch or so of the casing.

All fence posts must be at least three feet (3') off centerline of OPL's pipeline(s).

22. Defer any permanent structures, road crossings, or right-of-way alterations to Renton for decisions. Try to obtain a written proposal of work. When taking pictures of sites, be sure the pipeline is well marked so as to show up in the pictures.
23. If a one-call or action memo is a conflict, lay out (mark & flag) pipeline the day you receive the locate. Don't wait until the day of the crossing. (According to Washington State Substitute House Bill No. 857, Chapter 144, Laws of 1984, underground utilities have 48-hours to locate and mark their lines.) When marking line(s), be sure there is at least one pyramid with the letter "o" painted atop the pipe, and visible from at least fifty feet. (See example)
24. A lot of respect for you and for your company will be gained when you arrive at site, with the contractor present, having done your preliminary work and ready to start with the contractor's job. You will also be establishing a reputation for being a professional within the construction community.
25. When you finish a crossing or a locate and you're not pushed for time, get into the habit of riding the line. Make corrections as you ride along the line, such as replacing missing or damaged signs. Clean up grass or briars around the warning markers.

Places you should pay close attention to are bus stops, playgrounds, and schools, as these areas seem to draw more vandalism than any others do.

26. If contractor cannot backfill over our line(s) at close of his working day, he must sheet our line(s) with steel plating.
27. An OPL representative must be on-site while contractor or property owner digs across our line(s).

AERIAL PATROL REPORTS-RESPONSE PROCEDURES BY OPEATORS

1. Equipment working on R.O.W. check out immediately. R.O.W. office will notify Operators in that area either by Pager, Radio or Telephone.
2. Evidence of work on R.O.W. will be checked out immediately. R.O.W. office will notify Operators in that area either by Pager, Radio or Telephone.
3. If no one is on-site when you arrive, mark and flag fifty feet (50') in each direction. Also place a "stop work" tag on the equipment.
4. Equipment parked on or near R.O.W. but no activity. Check within 24 hours. Place "stop work" tag on equipment.
5. No one present on site and unable to determine property owner's name: Utilizing the Line Sheets get a stationing and/or easement number, and notify R.O.W. Office.
6. Evidence of any digging over the pipeline(s) that is discovered during the checkout of the Pilot Report: If the area over the pipeline has been disrupted, probe the line for depth. If the probing shows that the dig has reached the pipeline, the line will need to be exposed, to check for damage. In the event that the line has been scratched or dented the Operations Controller will be notified at once. The (concerned) Field Operations Coordinator and the Construction & Maintenance Supervisor will also be notified.

If the contractor or developer is still on-site get his name, telephone number, and address if possible. Get the vehicle license plate number if other information not available. While waiting for Construction personnel to arrive, you should be preparing the pipe to be gauged, for depth of scratch or dentage. If the scratch is greater than 10,000th of an inch, notify the O/C to lower the pressure. If the scratch is less than 10,000th of an inch, notify the O/C so they will be apprised of the situation.

7. "Previously reported" reports: Pilot will note if anything has changed from previous report. If no contract has been made, check weekly. If contact has been established, check bi-weekly.
8. If R.O.W. office contacts an operator to check out a Pilot Report, the concerned operator will take the responsibility to contact his supervisor or other personnel if there is a conflict.

Following is the procedure for the R.O.W. Office to follow when trying to contact someone to check out Pilot Reports: (A) Page Operator, wait thirty minutes (30) for return call; (B) Page Area Supervisor, wait thirty minutes (30) for return call; (C) Place call on "Area Wide", in the area of concern, for anybody in that area to

check out report; (D) Page Construction Supervisor, wait thirty minutes (30) for return call; or (E) Contact R.O.W. Office.

REPORTS/RIGHT-OF-WAY

1. CHECKOUT reports for Pilot/Locates to be returned to R.O.W. Office bi-weekly. Verbal notification within 3 working days.
2. "ONE CALL" and "ACTION MEMO" locates: note whether *NO CONFLICT* or *PENDING ACTION*, initial, and return to R.O.W. office.
3. Diagram of Change or Exposed Pipe Reports are to be completed and submitted to R.O.W. office within two weeks of job being completed.
4. Exposed Pipe Report will be filled out by the individual who was on-site when the pipe was exposed.
5. R.O.W. office will send out a report of delinquent "ONE CALL" locates, PILOT REPORT, and DIAGRAMS of CHANGE on a monthly basis.



**EXAMPLE OF OLYMPIC PIPE LINE MARKING
AS AN UNDERGROUND UTILITY**

AERIAL PATROL REPORTS - RESPONSE PROCEDURES BY OPERATORS

1. Equipment working on R.O.W. check out immediately. R.O.W. office will notify Operators in that area either by Pager, Radio or Telephone.
2. Evidence of work on R.O.W. will be checked out immediately. ROW office will notify Operators in that area either by Pager, Radio or Telephone.

(In remote and isolated areas, the Pilot will explain in his report how best to access areas of concern.)

3. If no one is on-site when you arrive, mark and flag fifty feet (50') in each direction. Also place a "stop work" tag on the equipment.
4. Equipment parked on or near R.O.W. but no activity. Check within 24 hours. Place "stop work" tag on equipment.
5. No one present on site and unable to determine property owner's name: Utilizing the Line Sheets get a stationing and/or easement number, and notify ROW Office.
6. If no contact is made and work appears ready to start, notify ROW Office A.S.A.P.
7. Evidence of any digging over the pipeline(s) that is discovered during the checkout of the Pilot Report: If the area over the pipeline has been disrupted, then the line will be probed. If the probing shows that the dig has reached the pipeline, then the line will be exposed, to check for damage. In the event that the line has been scratched or dented the Operations Controller will be notified at once. The (concerned) Area Chief and the Construction Supervisor will also be notified.

If the contractor or developer is still on-site get his name, telephone number, and address if possible. If nothing else, try and get the vehicle license plate number. While waiting for Construction personnel to arrive, you should be preparing the pipe to be gauged, for depth of scratch or dentage. If the scratch is greater than 10,000th of an inch, notify the O/C to lower the pressure. If the scratch is less than 10,000th of an inch, notify the O/C so they will be apprised of the situation.

8. "Previously reported" reports: Pilot will note if anything has changed from previous report. If no contact has been made, check weekly. If contact has been established, check bi-weekly.

9. If ROW office contacts an operator to check out a Pilot Report, the concerned operator will take the responsibility to contact his supervisor or other personnel if there is a conflict.

Following is the procedure for the ROW Office to follow when trying to contact someone to check out Pilot Reports: (A) Page Operator, wait thirty minutes (30) for return call; (B) Page Area Supervisor, wait thirty minutes (30) for return call; (C) Place call on Motorola repeater tower, in the area of concern, for anybody in that area to check out report; (D) Page Construction Supervisor, wait thirty minutes (30) for return call; or (E) Contact R.G. Burnett — if he is within a one-hour traveling time frame, he will check it out.

REPORTS/RIGHT-OF-WAY

1. CHECKOUT reports for Pilot/Locates to be returned to ROW Office bi-weekly. Verbal notification within 3 working days.
2. "ONE CALL" and "ACTION MEMO" locates: note whether *NO CONFLICT* or *PENDING ACTION*, initial, and return to ROW office.
3. Diagram of Change or Exposed Pipe Reports are to be completed and submitted to ROW office within two weeks of job being completed.
4. Exposed Pipe Report will be filled out by the individual who was on-site when the pipe was exposed.
5. R.O.W. office will send out a report of delinquent "ONE CALL" locates, PILOT REPORTS, and DIAGRAMS of CHANGE on a monthly basis.