

**US Department of Transportation
Pipeline and Hazardous Materials Safety Administration
Office of Pipeline Safety**

**Gas IMP Field Verification Inspection
49 CFR Subparts 192.911, 192.921, 192.933, & 192.935**

General Notes:

1. This Field Verification Inspection is performed on field activities being performed by an Operator in support of their Integrity Management Program (IMP).
2. This is a two part inspection form:
 - i. A review of applicable Operations and Maintenance (O&M) and IMP processes and procedures applicable to the field activity being inspected to ensure the operator is implementing their O&M and IMP Manuals in a consistent manner.
 - ii. A Field Verification Inspection to determine that activities on the pipeline and facilities are being performed in accordance with written procedures or guidance.
3. Not all parts of this form may be applicable to a specific Field Verification Inspection, and only those applicable portions of this form need to be completed. The applicable portions are identified in the Table below by a check mark. Only those sections of the form marked immediately below need to be documented as either “Satisfactory”; “Unsatisfactory”; or Not Checked (“N/C”). Those sections not marked below may be left blank.

Operator Inspected: **Arco Western Gas Pipeline**
Op ID: **570**

Perform Activity (denoted by mark)	Activity Number	Activity Description
	1A	In-Line Inspection
	1B	Hydrostatic Pressure Testing
	1C	Direct Assessment Technologies
	1D	Other Assessment Technologies
	2A	Remedial Actions
	2B	Remediation – Implementation
X	3A	Preventive & Mitigative – additional measures evaluated for HCAs
X	3B	Preventive & Mitigative – automatic shut-off valves
X	4A	Field Inspection for Verification of HCA Locations
	4B	Field Inspection for Verification of Anomaly Digs
X	4C	Field Inspection to Verify adequacy of the Cathodic Protection System
X	4D	Field inspection for general system characteristics
	attachment	Anomaly Evaluation Report
	attachment	Anomaly Repair Report

Gas IMP Field Verification Inspection Form

Name of Operator: **_Arco Western Gas Pipeline Co.**

Headquarters Address:

BP Pipelines (North America) Inc.
150 W. Warrenville Road
Naperville, IL 60563

Company Official: Steve Pankhurst, President

Phone Number: 630-536-2161

Fax Number: 630-536-2653

Operator ID: 570

Persons Interviewed	Title	Phone No.	E-Mail
Dennis Johnston	Olympic Pipeline Operator/North Core Team Leader Primary Contact	360-424-0365	johnstddf@bp.com
Jim Bruen	DOT Compliance Advisor	630-536-2535	jim.bruen@bp.com
Jim Atwood	E&M Specialist		
Nick Kitzmiller	District Corrosion Specialist	425-226-8883	nick.kitzmiller@bp.com

OPS/State Representative(s): **Dennis Ritter, Kuang Chu** Date(s) of Inspection: **11/28/12**

Inspector Signature: **Dennis Ritter**

Date: **12/17/12**

Pipeline Segment Descriptions: *[note: Description of the Pipeline Segment Inspected as part of this field verification. (If information is available, include the pipe size, wall thickness, grade, seam type, coating type, length, normal operating pressure, MAOP, %SMYS, HCA locations, class locations, and Pipeline Segment boundaries.)]*

The 16-inch Pipeline constructed 1990 originates near Sumas, WA at the Canadian border where it connects to the Spectra Energy, Inc. natural gas pipeline. From Sumas, the pipeline extends 31.7 miles to the BP Cherry Point Refinery. Additionally, there is a 4.5 mile segment of 8-inch pipeline that continues from the BP Cherry Point Refinery to the Intalco Aluminum facility in Ferndale, WA. The Pipeline was designed and constructed to qualify for operation within a Class 4 location. The Pipeline was constructed of 16", 0.250"WT ERW, API-5L X-65 steel line pipe and 8", 0.250"WT ERW, API 5L X42. At the time of construction, the Pipeline was hydrostatically tested to 1,828 psig for eight hours. At the time of construction the Pipeline route traversed predominately through farmed and wooded land. An updated class location study was completed in 2009. According to 49 CFR Part 192 criteria, the pipeline route remains overwhelmingly rural as shown in the following table:

<u>Class Location</u>	<u>Linear Route Distance (feet)</u>	<u>Percentage of Route</u>
1	136,731	71.4
2	43,431	22.7
3	11,269	5.9
4	0	0

The line pipe was mill coated with extruded polyethylene (EP) with shrink sleeves applied over field girth welds. Gas metering equipment consists of Siemens SITRANS FUG 1010 clamp-on non-intrusive ultrasonic flow meters at Sumas and Daniel ANSI gas turbine meters at Cherry Point. OMNI 6000 Flow computers assist in monitoring the balance of the system. The operators on the five (5) 16-inch mainline block valve installations are Shafer 9x12 gas-over-hydraulic rotary vane operators. These operators will automatically activate valve closure on detection of a sustained pressure drop or low pressure. All valves can be operated remotely and can be manually activated on site.

Site Location of field activities: *[note: Describe the portion of the pipeline segment reviewed during the field verification, i.e. milepost/stations/valves/pipe-to-soil readings/river crossings/etc. In addition, a brief description and case number of the follow up items in any PHMSA compliance action or consent agreement that required field verification. Note: Complete pages 8 & 9 as appropriate.]*

The inspection started at the Sumas gate station (MP 0) and terminated at the Alcoa Intalco aluminum smelter in Ferndale (MP 36.2, the end of the pipeline). All block valve locations were inspected and CP readings taken. All rectifiers were inspected and CP readings taken. All terminus points were inspected—Cherry Point refinery and Intalco aluminum smelter. There are three HCA areas along the 36.2 mile length of the pipeline which were also inspected. One is the contractor parking and trailer area at the BP refinery; the second is strip commercial area in Ferndale near the crossing with I-5; and the third is a large greenhouse complex within 100 yards of the pipeline near Lynden.

Summary:

All block valves were visited during this inspection. Block Valve 2 was operated manually to the closed position by imparting a pressure differential across the valve (it auto closes when it senses a 50 psi difference). The valve shut properly. Then the Tulsa control center remotely shut the valve and again it worked properly. All CP reads were OK per the criteria--greater (negative) than -850mV and all reads at rectifiers were acceptable. Records also indicated no issues. Two of the HCAs identified by the operator were visited during this inspection. All are properly classified as HCAs. The contractor area at the refinery is unusual in that it is temporary for construction activity at the refinery. However, this activity has been increasing in tempo since 2005. As such, this contractor area is occupied throughout the year and is properly classified by the operator.

Findings:

Records review and field inspection revealed no problem areas.

Key Documents Reviewed:

Document Title	Document No.	Rev. No	Date
Operations and Maintenance Emergency Response Plan Book 1 and Book 2			02/2012 & 08/2012
Notice of Intent to Increase Maximum Operating Pressure			10/26/12
BP Operator Qualification Study Guide	OQ COR 12		10/2008
BP Operator Qualification Study Guide	OQ Val 02		12/2011
BP Operator Qualification Study Guide	OQ PTP 04		09/2011
Manually Adjustable Pipeline Station Pressure Transmitter Inspection and Maintenance Procedure	USPL-MAN-734-020		03/2011

Part 1 - Performance of Integrity Assessments

1A. In-Line Inspection	Satisfactory	Unsatisfactory	N/C	Notes:
Verify that Operator’s O&M and IMP procedural requirements (e.g. launching/receiving tools) for performance of ILI were followed.				
Verify Operator’s ILI procedural requirements were followed (e.g. operation of trap for launching and receiving of pig, operational control of flow), as appropriate.				
Verify ILI tool systems and calibration checks before run were performed to ensure tool was operating correctly prior to assessment being performed, as appropriate.				
Verify ILI complied with Operator’s procedural requirements for performance of a successful assessment (e.g. speed of travel within limits, adequate transducer coverage), as appropriate.				
Document ILI Tool Vendor and Tool type (e.g. MFL, Deformation). Document other pertinent information about Vendor and Tool, as appropriate				
Verify that Operator’s personnel have access to applicable procedures for preparing, running and monitoring the pipeline for ILI tools include performance requirements (e.g.: tool speeds, pipe cleanliness, operation of tool sensors, and ILI field calibration requirements), as appropriate.				
Other:				<i>[Note: Add location specific information, as appropriate.]</i>
1B. Hydrostatic Pressure Testing	Satisfactory	Unsatisfactory	N/C	Notes:
Verify that hydrostatic pressure tests complied with Part 192 Subpart J requirements.				
Review documentation of Hydrostatic Pressure Test parameters and results. Verify test was performed without leakage and in compliance with Part 192 Subpart J requirements.				
Review test procedures and records and verify test acceptability and validity.				
Review determination of the cause of hydrostatic test failures, as appropriate.				
Document Hydrostatic Pressure Test Vendor and equipment used, as appropriate.				
Verify that the baseline assessment is conducted in a manner that minimizes environmental and safety risks (reference §192.919(e) and ADB-04-01)				
Other:				
1C. Direct Assessment Technologies	Satisfactory	Unsatisfactory	N/C	Notes:
Verify that application of “Direct Assessment Technology” complied with Part 192.923				
Review documentation of Operator’s application of “Direct Assessment Technology”, if available. Verify compliance with Part 192.923 and Operator’s procedural requirements, as applicable.				
Verify that appropriate tests and/or inspections are being performed and appropriate data is being collected, as appropriate.				
Other:				
1D. Other Assessment Technologies	Satisfactory	Unsatisfactory	N/C	Notes:
Verify that application of “Other Assessment Technology” complied with Operator’s requirements, that appropriate notifications had been submitted to PHMSA, and that appropriate data was collected.				
Review documentation of notification to PHMSA of Operator’s application of “Other Assessment Technology”, if available. Verify compliance with Operator’s procedural requirements. If documentation of notification to PHMSA of Operator’s application of “Other Assessment Technology” is available, verify performance of assessment within parameters originally submitted to PHMSA.				
Verify that appropriate tests are being performed and appropriate data is being collected, as appropriate.				
Other:				

Part 2 - Remediation of Anomalies

2A. Remedial Actions – Process	Satisfactory	Unsatisfactory	N/C	Notes:
Verify that remedial actions complied with the Operator’s procedural requirements.				<p>Cathodic Protection readings of pipe to soil at dig site (if available): On Potential: _____mV Off Potential: _____mV</p> <p><i>[Note: Add location specific information and note whether CP readings were from the surface or from the pipe following exposure, as appropriate.]</i></p>
Witness anomaly remediation and verify documentation of remediation (e.g. Exposed Pipe Reports, Maintenance Report, any Data Acquisition Forms). Verify compliance with Operator’s O&M Manual and Part 192 requirements.				
Verify that Operator’s procedures were followed in locating and exposing the anomaly (e.g. any required pressure reductions, line location, identifying approximate location of anomaly for excavation, excavation, coating removal).				
Verify that procedures were followed in measuring the anomaly, determining the severity of the anomaly, and determining remaining strength of the pipe. Review the class location factor and failure pressure ratio used by Operator in determining repair of anomaly.				
Verify that Operator’s personnel have access to and knowledge of applicable procedures.				
Other:				
2B. Remediation - Implementation	Satisfactory	Unsatisfactory	N/C	Notes:
Verify that the operator has adequately implemented its remediation process and procedures to effectively remediate conditions identified through integrity assessments or information analysis.				<p>Cathodic Protection readings of pipe to soil at dig site (if available): On Potential: _____mV Off Potential: _____mV</p> <p><i>[Note: Add location specific information and note whether CP readings were from the surface or from the pipe following exposure, as appropriate.]</i></p>
If documentation is available, verify that repairs were completed in accordance with the operator’s prioritized schedule and within the time frames allowed in §192.933(d).				
Review any documentation for this inspection site for an immediate repair condition (§192.933(d)(1)) where operating pressure was reduced or the pipeline was shutdown. Verify for an immediate repair condition that temporary operating pressure was determined in accordance with the requirements in §192.933(a) or, if not applicable, the operator should provide an engineering basis justifying the amount of pressure reduction.				
Verify that repairs were performed in accordance with §192.103, §192.111, §192.713, §192.717, §192.719, §192.933 and the Operator’s O&M Manual, as appropriate. If welding is performed, verify a qualified welding procedure and qualified welders are used to perform repairs. If composite repair methods are used, verify that a method approved by the Operator is used, procedures are followed, and qualified personnel perform the repair.				
Review CP readings at anomaly dig site, if possible. (See Part 4 of this form – “Field Inspection to Verify adequacy of the Cathodic Protection System” , as appropriate.				
Other:				

Part 3 - Preventive and Mitigative Actions

3A. P&M Measures for Third Party Damage	Satisfactory	Unsatisfactory	N/C	Notes:
Identify additional measures evaluated for the HCA section of the pipeline and facilities.	X			No third party damage to pipeline (ever).
Verify that P & M measures regarding threats due to third party damage are being implemented: [§192.915(c), §192.935(b)(1)(iv)]:				Run ILI pigs every 7 years. No anomalies found in last run July, 2012.
Confirm the use of qualified personnel for marking, locating, and direct supervision of known excavation work, as appropriate.				Per procedure, pipeline personnel must be onsite if any third party digs within 50 feet of pipeline.
Confirm the use of qualified personnel for monitoring of excavations conducted on covered pipeline segments by pipeline personnel, as appropriate.				Three HCAs on entire pipeline.
Other:				Dennis Johnson is on Whatcom Unified Emergency Planning Committee and attends all meetings (quarterly). He or Jim Fraley routinely give presentations on damage prevention at these meetings. Additionally, it became apparent during field portion of inspection that Dennis knows all farmers along pipeline. [Note: Add location specific information, as appropriate.]
3B. Installed Automatic Shut-off Valves (Protocol H.07)	Satisfactory	Unsatisfactory	N/C	Notes:
Verify additional preventive and mitigative actions implemented by Operator.	X			The operator installed automatic valves on every block valve along the pipeline. The valves are located every 5 miles along the pipeline and automatically shut when the system senses a 50psi pressure differential across the valve or the pressure drops to less than 300 psi. The operator demonstrated on Block valve No. 2 (randomly selected) that it does close with a pressure differential across the valve of 50 psi (valve started closing at 36 psi and was fully shut at 47 psi). Tulsa control center confirmed and also remotely operated valve. The operator also has a CPM leak detection system on this pipeline. The system uses the pressure, temperature and flow from the flow meters located at the gate station, and the terminal station meters to determine if system has integrity. The system is designed to detect a leak at 3% accuracy (or less). Reports are generated every day and is monitored by Tulsa Control Room.
Document that additional measures evaluated by the operator cover alternatives such as, installing Automatic Shut-off Valves or Remote Control Valves, installing computerized monitoring and leak detection systems, replacing pipe segments with pipe of heavier wall thickness, providing additional training to personnel on response procedures, conducting drills with local emergency responders and implementing additional inspection and maintenance programs, as appropriate				
Verify that the operator has a process to decide if automatic shut-off valves or remote control valves represent an efficient means of adding protection to potentially affected high consequence areas. [§192.935(c)]				
Verify operation of installed remote control valve by reviewing operator inspection/remote control records for partially opening and closing the valve, as appropriate.				
Other:				[Note: Add location specific information, as appropriate.]

Part 4 - Field Investigations (Additional Activities as appropriate)

4A. Field Inspection for Verification of HCA Locations	Satisfactory	Unsatisfactory	N/C	Notes:
Review HCAs locations as identified by the Operator. Utilize NPMS and Operator maps, as appropriate.	X			<p>New class location study completed July, 2012. Did not change MAOP or HCAs. Two HCA locations observed one near pipeline terminus at Cherry Point Refinery MP 32, the other near MP 25 adjacent to Interstate 5 and a commercial area. Both locations are appropriately classified.</p> <p>Current maps were accurate.</p> <p>[Note: Add location specific information, as appropriate.]</p>
Verify that the operator's integrity management program includes accurate and updated system maps or other suitably detailed means documenting the pipeline segment locations that are located in high consequence areas, as appropriate. [§192.905(a)]				
Review the operator's applicable procedures and forms used to document new information from one-calls, surveys, aerial & ground patrols are being completed by field personnel to communicate new developments that may impact high consequence areas or that may create new high consequence areas to IM personnel, as appropriate. [§192.905(c)]				
Review the operator's applicable procedures and forms to confirm that new HCAs and class location changes are being identified through it's continuing surveillance program as required by §192.613 and §192.905.				
4B. Field Inspection for Verification of Anomaly Digs	Satisfactory	Unsatisfactory	N/C	Notes:
Verify repair areas, ILI verification sites, etc.				<p>[Note: Add location specific information, as appropriate.]</p>
Document the anomaly dig sites observed and reviewed as part of this field activity and the actions taken by the operator.				
4C. Field Inspection to Verify adequacy of the Cathodic Protection System	Satisfactory	Unsatisfactory	N/C	Notes:
In case of hydrostatic pressure testing, Cathodic Protection (CP) systems must be evaluated for general adequacy.	X			<p>Checked p/s readings at multiple locations along pipeline and at all block valve locations and all rectifiers (along with voltage and current output). All CP readings were satisfactory. The operator has a special condition on the 8-inch line to Intalco (from Cherry Point refinery) in which the very large DC current from the aluminum smelter causes drastic reversals in potential along the pipeline route. This caused major pipeline damage to 24"</p>
The operator should review the CP system performance in conjunction with a hydrostatic pressure test to ensure the integrity assessment addressed applicable threats to the integrity of the pipeline. Has the operator reviewed the CP system performance in conjunction with the hydrostatic pressure test?				
Review records of CP readings from CIS and/or annual survey to ensure minimum code requirements are being met, if available.				

<p>Review results of random field CP readings performed during this activity to ensure minimum code requirements are being met, if possible. Perform random rectifier checks during this activity and ensure rectifiers are operating correctly, if possible. See field report Form 13</p>				<p>crude in same pipeline ROW approximately 8 years ago. The operator installed a variable output rectifier at approximately MP 35 to counteract this. The rectifier senses when Intalco is operating and puts current out relative to the influence by the smelter.</p> <p>Cathodic Protection readings of pipe to soil at dig site (if available): On Potential: _____ mV Off Potential: _____ mV</p> <p><i>[Note: Add location specific information and note whether CP readings were from the surface or from the pipe following exposure, as appropriate.]</i></p>
<p>4D. Field inspection for general system characteristics</p>				
<p>Through field inspection determine overall condition of pipeline and associated facilities for a general estimation of the effectiveness of the operator's IMP implementation.</p>	Satisfactory	Unsatisfactory	N/C	<p>Notes: ROW was checked in numerous locations along 36mi pipeline route. No issues observed. All block valves, gate stations had security systems in place and operational. Signs and placards were satisfactory—One-call and emergency phone numbers on markers and warning signs were correct. No markers noted missing during field inspection or during records review.</p>
Evaluate condition of the ROW of inspection site to ensure minimum code requirements are being met, as appropriate.	X			
Comment on Operator's apparent commitment to the integrity and safe operation of their system, as appropriate.				
Check ROW for pipeline markers in line-of-sight and Emergency call-in number on marker posts.				
Other:				

Anomaly Evaluation Report *(to be completed as appropriate)*

Pipeline System and Line Pipe Information		
Operator (OpID and System Name):		
Unit ID (Pipeline Name)		
Pipe Manufacturer and Year:	Seam Type and Orientation:	
Pipe Nominal OD (inch):	Depth of Cover:	
Pipe Nominal Wall thickness (inch):	Coating Type and Condition:	
Grade of Pipe:	MAOP:	
ILI Reported Information		
ILI Technology (e.g., Vendor, Tools):		
Anomaly Type (e.g., Mechanical, Metal Loss):		
Is anomaly in a segment that can affect an HCA? (Yes / No)		
Date of Tool Run (MM/DD/YY):	Date of Inspection Report (MM/DD/YY):	
Date of "Discovery of Anomaly" (MM/DD/YY):		
Type of "Condition" (e.g.; Immediate; 60-day; 180-day):		
Anomaly Feature (Int/Ext):	Orientation (O'clock position):	
Anomaly Details: Length (in):	Width (in):	Depth (in):
Anomaly Log Distance (ft):	Distance from Upstream weld (ft):	
Length of joint(s) of pipe in which anomaly is identified (ft):		
Anomaly Dig Site Information Summary		
Date of Anomaly Dig (MM/DD/YY):		
Location Information (describe or attach map):		
Mile Post Number:	Distance from A/G Reference (ft):	
Distance from Upstream weld (ft):		
GPS Readings (if available) Longitude:	Latitude:	
Anomaly Feature (Int/Ext):	Orientation:	
Length of joint of pipe in which anomaly is found (ft):		
For Mechanical Damage Anomaly		
Damage Type (e.g., original construction, plain dent, gouge):		
Length (in):	Width (in):	Depth (in):
Near a weld? (Yes / No):		
Gouge or metal loss associated with dent? (Yes / No):		Are multiple dents present? (Yes / No):
Did operator perform additional NDE to evaluate presence of cracks in dent? (Yes / No):		
Cracks associated with dent? (Yes / No):		
For Corrosion Metal Loss Anomaly		
Anomaly Type (e.g., pitting, general):		
Length (in):	Width (in):	Max. Depth (in):
Remaining minimum wall thickness (in):	Maximum % Wall Loss measurement(%):	
Safe pressure calculation (psi), as appropriate:		
For "Other Types" of Anomalies		
Describe anomaly (e.g., dent with metal loss, crack, seam defect, SCC):		
Length (in):	Width (in):	Max. Depth (in):
Other Information, as appropriate:		
Did operator perform additional NDE to evaluate presence of cracks? (Yes / No):		
Cracks present? (Yes / No):		

Anomaly Repair Report *(to be completed as appropriate)*

Repair Information		
Was a repair of the anomaly made? (Yes / No):		
Was Operating Pressure Reduced per 192.933(a) requirements?		
Was defect ground out to eliminate need for repair? (Yes / No):		
If grinding used, complete the following for affected area:		
Length (in):	Width (in):	Depth (in):
If NO repair of an anomaly for which RSTRENG/B31.G is applicable, were the Operator's RSTRENG/B31.G calculations reviewed? (Yes / No):		
If Repair made, complete the following:		
Repair Type (e.g., Type B-sleeve, composite wrap)		
Was defect ground out prior to making repair? (Yes / No):		
Operating Pressure at the time of repair:		
Length of Repair:	Pipe re-coating material used:	
Comments on Repair material, as appropriate (e.g., grade of steel, wall thickness):		
Comments on Repair procedure, as appropriate (e.g., welded sleeve, composite wrap):		
General Observations and Comments		
Was a diagram (e.g., corrosion map) of the anomaly made? (Yes / No):		(Include in report if available)
Were pipe-to-soil cathodic protection readings taken? (Yes / No):		
If CP readings taken, Record: On Potential: _____ mV; Off Potential: _____ mV		
<i>[Note: Note whether CP readings were from the surface or from the pipe following exposure, as appropriate.]</i>		
Describe method used by Operator to locate anomaly (as appropriate):		
Comments regarding procedures followed during excavation, repair of anomaly, and backfill (as appropriate):		
General Observations and Comments <i>(Note: attach photographs, sketches, etc., as appropriate)</i> :		