

# GAS STORAGE FIELD REVIEW

Unless otherwise noted, all code references are to 49CFR Part 192. S – Satisfactory U – Unsatisfactory N/A – Not Applicable N/C – Not Checked  
 If an item is marked U, N/A, or N/C, an explanation must be included in this report.

Add solid samples to the internal corrosion part of the form. A completed **Standard Inspection Report** is to be submitted to the Director within 60 days from completion of the inspection. A **Post Inspection Memorandum (PIM)** is to be completed and submitted to the Director within 30 days from the completion of the inspection, or series of inspections, and is to be filed as part of the **Standard Inspection Report**.

Inspection Report	Post Inspection Memorandum	
Inspector/Submit Date: S. Rukke 5/19/2011	Chief Eng/Review Date:	D. Lykken 5/20/2011
	Peer Review/Date:	
	Director Approval/Date:	
POST INSPECTION MEMORANDUM (PIM)		
Name of Operator: Puget Sound Energy	OPID #: 22189	
Name of Unit(s): Jackson Prairie Storage Facility	Unit #(s): 33875	
Records Location: Jackson Prairie Storage Facility	Activity #	
Unit Type & Commodity: Interstate Natural Gas Storage		
Inspection Type: Standard	Inspection Date(s): March 29 – 31, 2011, and April 20, 2011	
PHMSA Representative(s): Scott Rukke and Lex Vinsel, UTC - (Lex not present during April 20 insp.)		AFO Days: 7

**Company System Maps** (copies for Region Files):

Validate SMART Data (components, miles, etc):  Acquisition(s), Sale or New Construction (submit SMART update):

Validate Additional Requirements Resulting From Waiver(s) or Special Permit(s):

**Summary:**

Two probable violations noted in the following areas:

- 1) 192.731(a), Compressor Station Relief Devices (1 per yr/15 months)
- 2) 192.483 & 192.485, Remedial: Replaced or Repaired Pipe; coated and protected; corrosion evaluation and actions.

Record Review:

Included cathodic protection for plant piping and transmission pipeline including casings and rectifiers, maintenance of valves, pressure recording charts, Emergency Plan, Safety related condition reports, and Welding results,

Field Inspection:

Included new wellhead construction, new turbine/compressor station, CP for piping and rectifier units, ROW, firefighting equipment, pipe supports, and facility security systems.

Future Inspection:

It was recommended that future inspections be scheduled in the Fall of the year as in previous years.

**Findings:**

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### Findings:

Violations noted for the following areas:

- 1) 192.731(a), Compressor Station Relief Devices (1 per yr/15 months)  
Station over pressure relief valves 76, 44 and 43 were not operated during calendar year 2009 and exceeded 15 months between operation.
  
- 2) 192.483 & 192.485, Remedial: Replaced or Repaired Pipe; coated and protected; corrosion evaluation and actions.  
PSE procedure 4515.1760 requires engineering notification for pits over a certain depth as outlined in PSE's O&M manual. Engineering will then determine follow up requirements. At the time of this inspection several areas of localized pitting were found under the wrap located at the pipe to soil interface of some pipe risers. These pits had a depth greater than that requiring engineering notification but notification was not done. This is a probable violation of 192.13(c), failure to follow PSE's procedure 4515.1760.

All field facilities checked had adequate cathodic protection. Fire eyes were tested and all activated and alarmed as designed. Gas detectors were tested and alarmed at 20%LEL and activated the ESD at 40% LEL as designed. Over pressure protection valves tested all opened at proper set points. ESD shutdown devices were adequately placed but were not tested due to system constraints. Casings tested all had proper electrical isolation. Emergency valves tested were all operational. Inspection emphasis was placed on the Saturn compressor building.

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<b>Name of Operator:</b> Puget Sound Energy - Jackson Prairie Storage Facility			
<b>OP ID No.</b> <sup>(1)</sup> 22189		<b>Unit ID No.</b> <sup>(1)</sup> 33875	
<b>HQ Address:</b> Puget Sound Energy PO Box 90868 M/S PSE-12N Bellevue, WA 98009-0868		<b>System/Unit Name &amp; Address:</b> <sup>(1)</sup> Puget Sound Energy Jackson Prairie Natural Gas Storage Facility 239 Zandecki Rd Chehalis, WA 98532	
<b>Co. Official:</b>	Sue McLain Senior Vice President, Delivery Operations	<b>Activity Record ID No.:</b>	
<b>Phone No.:</b>	800-552-7171	<b>Phone No.:</b>	
<b>Fax No.:</b>		<b>Fax No.:</b>	
<b>Emergency Phone No.:</b>	800-552-7171	<b>Emergency Phone No.:</b>	
<b>Persons Interviewed</b>		<b>Title</b>	
<b>Phone No.</b>			
Jim Janson	Manager, Jackson Prairie	360-262-3365	
Darryl Hong	Compliance Coordinator	425-462-3911	
Toni Imad	Engineer	425-456-2970	
Rick Braaten	Plant Supervisor	360-262-0119	
<b>PHMSA Representative(s)</b> <sup>(1)</sup> Scott Rukke, UTC, Lex Vinsel. UTC (Lex not present during April 20 insp.)		<b>Inspection Date(s)</b> <sup>(1)</sup> March 29 – 31, 2011, and April 20, 2011	
<b>Company System Maps (Copies for Region Files):</b>			

<b>Counties of Operation: (list each field separately)</b> Chehalis
<b>Storage Field(s) Description: (list each field separately)</b> Jackson Prairie storage is the 14th largest storage reservoir in the United States in terms of capacity for natural gas withdrawal and delivery to consumers. The facility is co-owned with equal rights with Puget Sound Energy, Avista Utilities, and Williams Northwest Pipeline. The facility was authorized for underground storage of natural gas in 1963 and certified for commercial service in 1970. Today, the facility has storage for 23 billion cubic feet and is expanding capacity to 25 billion cubic feet by 2012 with an additional 48 billion cubic feet of "cushion" to provide pressure in the reservoirs. The facility consists of a series of deep, underground reservoirs of porous sandstone deposits approximately 1,000 to 3,000 feet below the ground surface. The storage facility has 102 wells spread across 3,200 acres for injection and withdrawal points for natural gas. The facility can meet up to 25% of the Pacific Northwest's peak natural gas demand on the coldest winter days. Major components of the facility includes: four transmission pipeline, well points, gathering lines, filtration, coalesce, dehydration, compression units for injection to the storage field or interstate pipeline, and SCADA control unit.
<b>Inspection Summary:</b> Numerous CP readings were conducted in the field both inside the plant grounds and within the storage field. A sampling of emergency valves were operated, above ground risers were inspected for signs of atmospheric corrosion and proper support, rectifiers were tested, casings were tested, fire eyes and gas detectors were tested, relief valves were tested and stored materials and pipe were inspected. All met code requirements. Note: 100% of above listed facilities were not inspected.

<sup>1</sup> Information not required if included on page 1.

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The attached evaluation form should be used in conjunction with 49CFR Parts 191 and 192.

### PIPE TYPE

	Bare steel	Coated steel	Ineffectively Coated	Pre70-ERW	Plastic	Other: must specify type
Footage/Mileage		15.57 miles				

### PIPE SPECIFICATIONS (2" AND LARGER)

	14-inch	16-inch	20-inch	24-inch	8-5/8-inch	6-5/8-inch
Diameter(s)	14-inch	16-inch	20-inch	24-inch	8-5/8-inch	6-5/8-inch
Pipe Grade(s)	X-46	X-42	X-56	X-70		
Wall Thickness(s)	.250 inch	.312 inch	.375 inch	.250-.365 inch		
Footage/Mileage	9,031'	16,366'	9,053'	12,702'	13,068'	14,849'

### WELL STIMULATION

#### ACIDIZING

Acidizing treatments used to stimulate the wells?	<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No
Type(s) of acids used in treating the wells: 15% HCl		
Type(s) of inhibitors used with the acid(s):	Varies	
Frequency of the treatments: Rare. Last used in the late 1990's	Volume of acid per treatment: <600 Gal.	
Well cleanup procedure following treatment:	Yes, flowed back into the well procedure.	
If treatment is flowed back into the well/injection line, criteria used to determine that the treatment will not cause internal corrosion or erosion of the pipe:	Nothing specific.	

#### FRACTURING

Fracturing treatments used to stimulate the wells?	<input type="checkbox"/> Yes	<input checked="" type="checkbox"/> No
Type(s) of fracturing fluids used in treating the wells: N/A		
Type(s) of inhibitors used with the fracturing fluid(s):		
Frequency of the treatments: N/A	Amount of sand per treatment: N/A	
Well cleanup procedure following treatment:	N/A	
If treatment is flowed back into the well/injection line, criteria used to determine that the treatment will not cause internal corrosion or erosion of the pipe:	N/A	

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<b>GAS and LIQUID HANDLING FACILITIES</b>	
<b>GAS COMPRESSION</b>	
Location of compressors:	Jackson Prairie Compressor Station
Number, Size (HP), and Date of Installation of Units:	C-1 670Hp 10/65 Walkinshaw reciprocating engine used at Zone 9 for reinjection of gas. C-2 1,000Hp 11/66 Saturn turbine/compressor. In 2008 was replaced with 1,600Hp Saturn T20 C-3 1,000Hp 9/66 Saturn turbine/compressor. In 2008 was replaced with 1,600Hp Saturn T20 C-4 1,000Hp 11/66 Saturn turbine/compressor. In 2008 was replaced with 1,600Hp Saturn T20 C-5 1,300Hp 12/68 Saturn turbine/compressor C-6 4,417Hp 11/73 Centaur turbine/compressor C-7 4,417Hp 11/75 Centaur turbine/compressor C-8 7,000Hp 11/99 Taurus-60 turbine/compressor C-9 10,500Hp 11/08 Taurus-70 turbine/compressor IR-1 145Hp 1/01 Caterpillar engine for recycle gas within the storage field. IR-2 145Hp 1/02 Caterpillar engine for recycle gas within the storage field. IR-3 75Hp 3/09 Electric compressor for recycle gas within the storage facility
<b>GAS DEHYDRATION</b>	
Location of dehydration units:	Jackson Prairie Compressor Station
Type(s) of dehydration process used:	Glyco, bubble cap tray, triethylene glycol at 1,150 MMCF/Day.
Number of dehydration units:	12 towers
	Dehydration capacity: One billion CF daily
<b>GAS SWEETENING (Acid Gas Treating)</b>	
Location of sweetening units:	N/A
Type(s) of sweetening process used:	N/A
Number of sweetening units:	N/A
	Sweetening capacity: N/A
<b>GAS / LIQUID SEPARATION</b>	
<b>SCRUBBERS / SEPARATORS:</b>	Yes
Location of scrubbers/separators:	At each gas well site has a two-phase separator and at the plant facility there three vortex separators for water removal.
Type(s) of scrubbers/separators used:	Two-Phase separators
Number of scrubbers/separators:	54
	Separation capacity: 20 to 80 Million CF/Day
<b>DRIPS:</b>	Yes
Location of drips:	Station and at low elevations along the pipeline
Type(s) of drips used:	Slug-Catcher at the Plant Station
Number of drips:	One at the Plant Station and three field sites.

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Frequency of draining or blowing drips: As needed
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## FIELD OPERATING PARAMETERS

### PRESSURES, RATES and TEMPERATURES

	Pressure, psi		Flow Rate, MMcf/day		Temperature, °F	
	Injection	Withdrawal	Injection	Withdrawal	Injection	Withdrawal
Maximum	855	800	450	1150	110	110
Minimum	370	370	50	50	40	40

Maximum Allowable Operating Pressure (Field):

### WATER, CO<sub>2</sub>, and O<sub>2</sub> CONTENT

	Water, lbs./MMcf	CO <sub>2</sub> , %	H <sub>2</sub> S, ppm	O <sub>2</sub> , %
Injection Cycle	7#	0.04%	0	Negligible
Withdrawal Cycle	28 – 30 #	0.04%	0	Negligible

## FIELD OPERATING AND MAINTENANCE HISTORY

### LEAKS (NON-RUPTURES)

Are leak surveys of the field being conducted? (49 CFR 192.706)     Yes    \_\_\_ No

Have any leaks been found within last 5 years or since last DOT inspection?    \_\_\_ Yes     No    Number of leaks: 0

Types of leaks that have occurred?  
N/A

Cause(s) of the leaks:  
N/A

Location(s) of the leaks:  
N/A

Has a trend analysis been performed?    \_\_\_ Yes     No

If a trend analysis has been done, what do the results indicate?

### FAILURE/RUPTURES

Have any failures occurred within last 5 years or since last DOT inspection?    \_\_\_ Yes     No    Number of failures: 0

Type(s) of failures that have occurred:

Cause(s) of the failures:

Location(s) of the failures:

Has a trend analysis been performed?    \_\_\_ Yes    \_\_\_ No

If a trend analysis has been done, what do the results indicate?

### LINE REPLACEMENTS

Have any lines been replaced within last 5 years or since last DOT inspection?     Yes    \_\_\_ No    Number of replacements: 1

Type(s) of replacements:  
14" inline tee

Location(s) of the replacements:  
500 yards west of compressor station, inlet to sole district regulator

Reason(s) for replacements: Bring up to current standards.

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LINE REPAIRS			
Have any lines been repaired within last 5 years or since last DOT inspection? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No		Number of repairs:	
Type(s) of repairs:			
Location(s) of the repairs:			
Reason(s) for the repairs:			
VALVE REPLACEMENTS			
Have any valves been replaced within last 5 years or since last DOT inspection? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No		Number of replacements:	
Type(s) of valve replacements:			
Location(s) of the replacements:			
Reason(s) for the replacements:			
GAS and LIQUID HANDLING FACILITY UPSETS			
	Gas Dehydration Units	Gas Sweetening Units	Separators
Number of upsets – within last 5 years or since last DOT inspection?	None	N/A	None
Cause(s) of the upsets:			
Has a trend analysis been performed? <input type="checkbox"/> Yes <input type="checkbox"/> No			
If a trend analysis has been done, what do the results indicate?			

### CORROSION CONTROL AND MONITORING

EXTERNAL CORROSION					
Are the field piping and related storage field facilities cathodically protected? (49 CFR 192 Subpart I) <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No					
Type(s) of cathodic protection used: <input checked="" type="checkbox"/> Impressed Current <input type="checkbox"/> Galvanic Anodes <input type="checkbox"/> Combination					
Criteria used to determine adequate cathodic protection: -850 mVdc, ON					
Does the field piping system contain any bare or ineffectively coated pipe? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No					
Location(s) of the bare or ineffectively coated pipe:					
Amount of bare or ineffectively coated pipe:					
Are corrosion monitoring procedures established for the field piping and related storage field facilities? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No					
MONITORING					
Pipe-to-soil readings	<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No	Exposed pipe reports	<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No
Close interval surveys	<input type="checkbox"/> Yes	<input checked="" type="checkbox"/> No	Leak surveys	<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No
Line current surveys	<input type="checkbox"/> Yes	<input checked="" type="checkbox"/> No	Instrumented inspection surveys	<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No

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EXTERNAL CORROSION
Remedial measures taken to mitigate corrosion:

INTERNAL CORROSION	
Are corrosion monitoring procedures established for the field piping and related storage field facilities? <span style="float: right;"><input checked="" type="checkbox"/> Yes <input type="checkbox"/> No</span>	
MONITORING	
Corrosion coupons <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	Pipe replacement reports surveys <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
Gas samples <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	Leak surveys <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
Water samples <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	Instrumental inspection surveys <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
Solids samples <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	

CORROSION COUPONS
Frequency coupons are analyzed (minimum two times each calendar year, but with interval not exceeding 7 ½ months): Four times per year per records review although PSE's manual states two times per year.
Location(s) where coupons are installed:  A corrosion coupon is installed near the bottom of the 36" slug catcher unit.

GAS SAMPLES	
Frequency of sampling: Random	
Location(s) where the samples taken: At well heads.	
Are the gas samples analyzed for:	Amount of the following present in the gas:
Carbon dioxide (CO <sub>2</sub> ) <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	Carbon dioxide (CO <sub>2</sub> ) <u>Not detected</u>
Hydrogen sulfide (H <sub>2</sub> S) <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	Hydrogen sulfide (H <sub>2</sub> S) <u>Not detected</u>
Oxygen (O <sub>2</sub> ) <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	Oxygen (O <sub>2</sub> ) <u>Not detected</u>
Water vapor <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	Water vapor <u>Varies. Water is collected at low points near wellhead and drained from pipeline.</u>

What carbon dioxide (CO <sub>2</sub> ) partial pressure criteria are used to establish carbon dioxide (CO <sub>2</sub> ) corrosivity ranges? N/A
What is the carbon dioxide (CO <sub>2</sub> ) corrosivity ranges? N/A
What is the carbon dioxide (CO <sub>2</sub> ) partial pressure? Insignificant

WATER/LIQUIDS SAMPLES
Frequency of sampling: As needed
Locations where the samples are taken: At well heads.
What constituents are the water samples analyzed for? (Refer to the Water Analysis Checklist) <b>Last tested in January 1985</b>

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### INTERNAL CORROSION

Concentration of the following present in water:			Amount of the following gases dissolved in the water:		
Iron	(Fe <sup>++</sup> )	1.0 ppm	Carbon dioxide	(CO <sub>2</sub> )	Varies 0.06 - 0.47 ppm
Manganese	(Mn <sup>++</sup> )	0.18 ppm	Hydrogen sulfide	(H <sub>2</sub> S)	0
Chlorides	(Cl <sup>-</sup> )	19,000 ppm	Oxygen	(O <sub>2</sub> )	Not tested
Sulfates	(SO <sub>4</sub> <sup>=</sup> )	2 ppm			

Is the pH of the water below 6.8?     Yes                       No

Is hydrostatic test water sampled for the presence of bacteria?     Yes                       No

Are liquids tested for evidence of excessive glycol in the pipeline, which if deteriorated, could lower the pH?     Yes                       No

**SOLIDS SAMPLES (collected at pig receivers)**

Frequency of sampling: N/A. No pigging has been performed.

Locations where the samples taken:

Are solids observed and/or tested for the following components?

Iron Oxide	<input type="checkbox"/> Yes	<input type="checkbox"/> No	Scales	<input type="checkbox"/> Yes	<input type="checkbox"/> No
Iron Sulfide	<input type="checkbox"/> Yes	<input type="checkbox"/> No	Sand	<input type="checkbox"/> Yes	<input type="checkbox"/> No

Is the volume of solids increasing or decreasing between pig runs?

Comments:

### ATMOSPHERIC CORROSION

Are corrosion monitoring procedures established for the field piping and related storage field facilities?     No                       Yes

Location(s) where corrosion has been found:  
 At pipe risers at the soil to air interface.

Remedial measures taken to mitigate corrosion:  
 Remaining strength calculations performed. Sand blasted with walnut shells and recoated.

### INSTRUMENTED INSPECTION SURVEYS

Frequency surveys are conducted: N/A

Lines that have been surveyed and when the survey was conducted:

### INHIBITOR PROGRAM

Has a corrosion inhibitor program been established for the field piping and related storage field facilities?     Yes                       No

When did the program start?

Type(s) of treatment method used:     Batch                       Continuous

Type(s) of inhibitors used:

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## INHIBITOR PROGRAM

Are liquid samples periodically taken to test for residual corrosion inhibitor, to help determine effectiveness?  Yes  No

## MAINTENANCE PIGGING

(See also solids and water sampling, inhibitor sections)

Does operator have a maintenance pigging program designed to sweep the lines of sediments and/or scale?  Yes  No

Does operator adhere to the pigging program?  Yes  No

Comments:

## CONTROLLING GAS VELOCITY – INTERNAL CORROSION AND EROSION

Have target flow rates been determined for the field piping system?  Yes  No

Are injection/withdrawal flow rates kept within the targeted flow rates, to minimize sediment and water build-up, and to manage erosion?  
 Yes  No

Has erosion been observed during replacement of components (lines, valves, fittings, etc.)?  Yes  No

Locations where erosion has been found:

Remedial measures taken to mitigate erosion:

## SAFETY DEVICES and SYSTEMS

### SURFACE FACILITIES

Has a system safety analysis of the field piping and related storage facilities been performed:  Yes  No

Has a safety analysis function evaluation chart for the field piping and related storage field facilities been prepared?  Yes  No

### PRESSURE SAFETY DEVICES:

#### COMPRESSORS

Is each compressor, per 49 CFR 192.169, equipped with pressure safety devices for overpressure protection?  Yes  No

Pressure protection provided by:

Primary Compressor Controls  
 Secondary Station Controls (Software)

Location of pressure safety devices:

Primary At Skid  
 Secondary At SCADA Station

#### PRESSURE VESSELS

Is the working pressure of each pressure vessel (dehydrator, scrubber, etc.) greater than the MAOP?  Yes  No

Is each pressure vessel equipped with pressure safety devices for overpressure protection?  Yes  No

Pressure protection provided by:

Primary Station Over Pressure Protection via ESD or SSD.  
 Secondary Relief valves at vessels

Location of pressure safety devices:

Primary Station Blow Down Tower.  
 Secondary At four cooler stations.

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SURFACE FACILITIES	
<b>HEADERS, LATERALS and WELL LINES</b>	
Are the headers, laterals and well lines equipped with pressure safety devices for overpressure protection? <span style="float: right;"><input checked="" type="checkbox"/> Yes <input type="checkbox"/> No</span>	
Pressure protection provided by:	Location of pressure safety devices:
Primary Station Over Pressure via ESD or SSD.	Primary At Compressor Station Facility
Secondary Station Over Pressure via ESD or SSD.	Secondary At Compressor Station Facility
<b>GAS DETECTION SAFETY DEVICES:</b>	
Is each compressor, per 49 CFR 192.736, building equipped with gas detection safety devices? <span style="float: right;"><input checked="" type="checkbox"/> Yes <input type="checkbox"/> No</span>	
Are other buildings that contain gas handling equipment equipped with gas detection safety devices? <span style="float: right;"><input checked="" type="checkbox"/> Yes <input type="checkbox"/> No</span>	
Type(s) of gas detection safety devices: <input checked="" type="checkbox"/> Combustible gas (L.E.L.) <input type="checkbox"/> Hydrogen Sulfide (H <sub>2</sub> S) <input type="checkbox"/> Other:	
Type(s) of alarms used to notify personnel to the presence of gas: <input type="checkbox"/> Visual <input type="checkbox"/> Audible <input checked="" type="checkbox"/> Combination	
<b>FIRE DETECTION SAFETY DEVICES:</b>	
Is each compressor building equipped with fire detection safety devices? <span style="float: right;"><input checked="" type="checkbox"/> Yes <input type="checkbox"/> No</span>	
Are other buildings that contain gas handling equipment equipped with fire detection safety devices: <span style="float: right;"><input checked="" type="checkbox"/> Yes <input type="checkbox"/> No</span>	
Type(s) of fire detection safety devices:	
<input checked="" type="checkbox"/> Flame <input type="checkbox"/> Heat <input type="checkbox"/> Smoke <input type="checkbox"/> Fusible Material	
<input checked="" type="checkbox"/> Other: UV & IR	
Type(s) of alarms used to notify personnel to the presence of fire:	
<input type="checkbox"/> Visual <input type="checkbox"/> Audible <input checked="" type="checkbox"/> Combination	
<b>EMERGENCY SHUTDOWN SYSTEM:</b>	
Is each compressor station, per 49 CFR 192.167, equipped with a remote controlled emergency shutdown system? <span style="float: right;"><input checked="" type="checkbox"/> Yes <input type="checkbox"/> No</span>	
Does the gas detection system activate the compressor station emergency shutdown system? <span style="float: right;"><input checked="" type="checkbox"/> Yes <input type="checkbox"/> No</span>	
Does the fire detection system activate the compressor station emergency shutdown system? <span style="float: right;"><input checked="" type="checkbox"/> Yes <input type="checkbox"/> No</span>	
WELLS	
Is each well equipped with a well storage safety valve? <span style="float: right;"><input checked="" type="checkbox"/> Yes <input type="checkbox"/> No</span>	
If not, are there plans to equip each well with a well storage safety valve? <span style="float: right;"><input type="checkbox"/> Yes <input type="checkbox"/> No</span>	
Reasons why wells should not be equipped with well storage safety valve(s)?	

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## ADDITIONAL COMMENTS

Compressor stations are set to ESD at 40% LEL.

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### WATER ANALYSIS CHECKLISTS

Constituent			Does Operator test for:		Operator's "threshold"	Constituent			Does Operator test for:		Operator's "threshold"
			Yes	No					Yes	No	
Sodium		Na <sup>+</sup>	x			Chloride		Cl <sup>-</sup>	x		
Potassium		K <sup>+</sup>	x			Sulfate		SO <sub>4</sub> <sup>-</sup>	x		
Calcium		Ca <sup>++</sup>	x			Carbonate		CO <sub>3</sub> <sup>-</sup>	x		
Magnesium		Mg <sup>++</sup>	x			Bicarbonate		HCO <sub>3</sub> <sup>-</sup>	x		
Iron		Fe <sup>++</sup>	x			Hydroxide		OH <sup>-</sup>		x	
Barium		Ba <sup>++</sup>	x			Dissolved Oxygen		O <sub>2</sub>	x		
Strontium		Sr <sup>++</sup>		x		Dissolved Carbon Dioxide		CO <sub>2</sub>		x	
Manganese		Mn <sup>++</sup>	x			Dissolved Hydrogen Sulfide		H <sub>2</sub> S		x	
Lead		Pb	x								
Zinc		Zn	x								

Other	Does Operator test for ...		Operator's "threshold"	Other	Does Operator test for ...		Operator's "threshold"
	Yes	No			Yes	No	
Acidity	x			Alkalinity	x		
pH	x			Salinity	x		19,000 ppm
Total Dissolved Solids (TDS)	x		34,000 ppm	Acid-producing Bacteria		x	
Sulfate-reducing Bacteria		x					

Excessive values of the above-listed constituents and properties, dependent upon operating conditions and other factors that may be unique to the storage field, could indicate a corrosive condition in the pipeline.

## GAS STORAGE FIELD REVIEW

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PIPELINE INSPECTION (Field)		S	U	N/A	N/C
.143/(b)/.476	Design and construction of new and replaced transmission line and components.	x			
.179	Valve Protection from Tampering or Damage	x			
.463	Cathodic Protection	x			
.465	Rectifiers	x			
.479	Pipeline Components Exposed to the Atmosphere	x			
.605	Knowledge of Operating Personnel	x			
.707	ROW Markers, Road and Railroad Crossings	x			
.719	Pre-pressure Tested Pipe ( <b>Markings and Inventory</b> )	x			
.739/.743	Pressure Limiting and Regulating Devices (spot-check field installed equipment vs. inspection records)			x	
.745	Valve Maintenance	x			
.751	Warning Signs	x			
.801 - .809	Operator Qualification - Use PHMSA Form 15 Operator Qualification Field Inspection Protocol Form	x			

**Comments:**

Pressure regulators and limiting devices are for the Intermediate Distribution System that is covered in PSE's Lewis County Inspection.

COMPRESSOR STATIONS INSPECTION (Field)		S	U	N/A	N/C
(Note: Facilities may be "Grandfathered")					
.143/(b)/.476	Design and construction of new and replaced transmission line and components (excludes offshore or facilities installed or replaced before 05/23/07).	x			
.163 (c)	Main operating floor must have (at least) two (2) separate and unobstructed exits	x			
	Door latch must open from inside without a key	x			
(d)	Doors must swing outward	x			
	Each fence around a compressor station must have (at least) 2 gates or other facilities for emergency exit	x			
	Each gate located within 200 ft of any compressor plant building must open outward	x			
(e)	When occupied, the door must be opened from the inside without a key	x			
	Does the equipment and wiring within compressor stations conform to the <b>National Electric Code, ANSI/NFPA 70?</b>	x			
.165(a)	If applicable, are there liquid separator(s) on the intake to the compressors?	x			
.165(b)	Do the liquid separators have a manual means of removing liquids?	x			
	If slugs of liquid could be carried into the compressors, are there automatic dumps on the separators, Automatic compressor shutdown devices, or high liquid level alarms?	x			
.167(a)	ESD system must:				
	- Discharge blowdown gas to a safe location	x			
	- Block and blowdown the gas in the station	x			
	- Shut down gas compressing equipment, gas fires, electrical facilities in compressor building and near gas headers	x			
	- Maintain necessary electrical circuits for emergency lighting and circuits needed to protect equipment from damage	x			
	ESD system must be operable from at least two locations, each of which is:				
	- Outside the gas area of the station	x			
	- Not more than 500 feet from the limits of the station	x			
- ESD switches near emergency exits?	x				



# GAS STORAGE FIELD REVIEW

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<b>COMPRESSOR STATIONS INSPECTION (Field)</b>		S	U	N/A	N/C
(Note: Facilities may be "Grandfathered")					
.167 (b)	For stations supplying gas directly to distribution systems, is the ESD system configured so that the LDC will not be shut down if the ESD is activated?	x			
.171(a)	Does the compressor station have adequate fire protection facilities? If fire pumps are used, they must not be affected by the ESD system.			x	
(b)	Do the compressor station prime movers (other than electrical movers) have over-speed shutdown?	x			
(c)	Do the compressor units alarm or shutdown in the event of inadequate cooling or lubrication of the unit(s)?	x			
(d)	Are the gas compressor units equipped to automatically stop fuel flow and vent the engine if the engine is stopped for any reason?	x			
(e)	Are the mufflers equipped with vents to vent any trapped gas?	x			
.173	Is each compressor station building adequately ventilated?	x			
.457	Is all buried piping cathodically protected?	x			
.481	Atmospheric corrosion of aboveground facilities	x			
.603	Does the operator have procedures for the start-up and shut-down of the station and/or compressor units?	x			
	Are facility maps current/up-to-date?	x			
.615	Emergency Plan for the station on site?	x			
.619	Review pressure recording charts and/or SCADA	x			
.707	Markers	x			
.731	Overpressure protection – reliefs or shutdowns	x			
.735	Are combustible materials in quantities exceeding normal daily usage, stored a safe distance from the compressor building?	x			
	Are aboveground oil or gasoline storage tanks protected in accordance with NFPA standard No. 30?	x			
.736	Gas detection – location	x			

**Comments:**

<b>REPORTING PERFORMANCE AND RECORDS</b>		S	U	N/A	N/C
191.5	Telephonic reports to NRC (800-424-8802)			x	
191.15	Written incident reports; supplemental incident reports (DOT Form PHMSA F 7100.2)			x	
191.17 (a)	Annual Report (DOT Form PHMSA F 7100.2-1)	x			
191.23	Safety related condition reports			x	
192.727 (g)	Abandoned facilities, onshore crossing commercially navigable waterways reports			x	

**Comments:**  
 191.5: No reports since last inspection.  
 191.15: No reports since last inspection.  
 191.23: No reports since last inspection.  
 191.727: No facilities meeting this criteria.

<b>CONSTRUCTION PERFORMANCE AND RECORDS</b>		S	U	N/A	N/C
.225	Test Results to Qualify Welding Procedures	x			
.227	Welder Qualification	x			
.241 (a)	Visual Weld Inspector Training/Experience	x			
.243 (b)(2)	Nondestructive Technician Qualification	x			
(c)	NDT procedures	x			

# GAS STORAGE FIELD REVIEW

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CONSTRUCTION PERFORMANCE AND RECORDS		S	U	N/A	N/C
(f)	Total Number of Girth Welds	x			
(f)	Number of Welds Inspected by NDT	x			
(f)	Number of Welds Rejected	x			
(f)	Disposition of each Weld Rejected	x			
.303	Construction Specifications	x			
.325	Underground Clearance	x			
.327	Amount, Location, Cover of each Size of Pipe Installed	x			
.455	Cathodic Protection	x			

OPERATIONS and MAINTENANCE PERFORMANCE AND RECORDS		S	U	N/A	N/C
.603(b)	.605(a) Procedural Manual Review – Operations and Maintenance (1 per yr/15 months)	x			
.603(b)	.605(c) Abnormal Operations	x			
.603(b)	.605(b)(3) Availability of construction records, maps, operating history to operating personnel	x			
.603(b)	.605(b)(8) Periodic review of personnel work – effectiveness of normal O&M procedures	x			
.603(b)	.605(c)(4) Periodic review of personnel work – effectiveness of abnormal operation procedures	x			
.709	.614 Damage Prevention (Miscellaneous)	x			
.709	.609 Class Location Study (If Applicable)	x			
.603(b)	.615(b)(1) Location Specific Emergency Plan	x			
.603(b)	.615(b)(2) Emergency Procedure training, verify effectiveness of training	x			
.603(b)	.615(b)(3) Employee Emergency activity review, determine if procedures were followed.	x			
.603(b)	.615(c) Liaison Program with Public Officials	x			
.605(a)	.616 Public Awareness Program also in accordance with API RP 1162				
	.616(e & f) Documentation properly and adequately reflects implementation of operator’s Public Awareness Program requirements - Stakeholder Audience identification, message type and content, delivery method and frequency, supplemental enhancements, program evaluations, etc. (i.e. contact or mailing rosters, postage receipts, return receipts, audience contact documentation, etc. for emergency responder, public officials, school superintendents, program evaluations, etc.). See table below:	x			
	<b>API RP 1162 Baseline* Recommended Message Deliveries</b>				
	<b>Stakeholder Audience (Natural Gas Transmission Line Operators)</b>				
	<b>Baseline Message Frequency (starting from effective date of Plane)</b>				
	Residents Along Right-of-Way and Places of Congregation				
	Emergency Officials				
	Public Officials				
	Excavator and Contractors				
	One-Call Centers				
	<b>Stakeholder Audience (Gathering Line Operators)</b>				
	<b>Baseline Message Frequency (starting from effective date of Plan)</b>				
	Residents and Places of Congregation				
	Emergency Officials				
	Public Officials				
	Excavators and Contractors				
	One-Call Centers				
	.616(g) The program must be conducted in English and any other languages commonly understood by a significant number of the population in the operator's area?	x			
.517	Pressure Testing	x			

# GAS STORAGE FIELD REVIEW

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OPERATIONS and MAINTENANCE PERFORMANCE AND RECORDS			S	U	N/A	N/C												
.709	.619	Maximum Allowable Operating Pressure (MAOP)	x															
.709	.625	Odorization of Gas			x													
.709	.705	Patrolling (Refer to Table Below)	x															
<table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="width: 30%;">Class Location</th> <th style="width: 35%;">At Highway and Railroad Crossings</th> <th style="width: 35%;">At All Other Places</th> </tr> </thead> <tbody> <tr> <td style="text-align: center;">1 and 2</td> <td style="text-align: center;">2/yr (7½ months)</td> <td style="text-align: center;">1/yr (15 months)</td> </tr> <tr> <td style="text-align: center;">3</td> <td style="text-align: center;">4/yr (4½ months)</td> <td style="text-align: center;">2/yr (7½ months)</td> </tr> <tr> <td style="text-align: center;">4</td> <td style="text-align: center;">4/yr (4½ months)</td> <td style="text-align: center;">4/yr (4½ months)</td> </tr> </tbody> </table>							Class Location	At Highway and Railroad Crossings	At All Other Places	1 and 2	2/yr (7½ months)	1/yr (15 months)	3	4/yr (4½ months)	2/yr (7½ months)	4	4/yr (4½ months)	4/yr (4½ months)
Class Location	At Highway and Railroad Crossings	At All Other Places																
1 and 2	2/yr (7½ months)	1/yr (15 months)																
3	4/yr (4½ months)	2/yr (7½ months)																
4	4/yr (4½ months)	4/yr (4½ months)																
.709	.706	Leak Surveys (Refer to Table Below)	x															
<table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="width: 30%;">Class Location</th> <th style="width: 35%;">Required</th> <th style="width: 35%;">Not Exceed</th> </tr> </thead> <tbody> <tr> <td style="text-align: center;">1 and 2</td> <td style="text-align: center;">1/yr</td> <td style="text-align: center;">15 months</td> </tr> <tr> <td style="text-align: center;">3</td> <td style="text-align: center;">2/yr*</td> <td style="text-align: center;">7½ months</td> </tr> <tr> <td style="text-align: center;">4</td> <td style="text-align: center;">4/yr*</td> <td style="text-align: center;">4½ months</td> </tr> </tbody> </table> <p>* Leak detector equipment survey required for lines transporting un-odorized gas.</p>							Class Location	Required	Not Exceed	1 and 2	1/yr	15 months	3	2/yr*	7½ months	4	4/yr*	4½ months
Class Location	Required	Not Exceed																
1 and 2	1/yr	15 months																
3	2/yr*	7½ months																
4	4/yr*	4½ months																
.603b/.727g	.727	Abandoned Pipelines also Underwater Facility Reports if applicable			x													
.709	.731(a)	Compressor Station Relief Devices (1 per yr/15 months)		x														
.709	.731(c)	Compressor Station Emergency Shutdown (1 per yr/15 months)	x															
.709	.736(c)	Compressor Stations – Detection and Alarms (Performance Test)	x															
.709	.739	Pressure Limiting and Regulating Stations (1 per yr/15 months)			x													
.709	.743	Pressure Limiting and Regulator Stations – Capacity (1 per yr/15 months)			x													
.709	.745	Valve Maintenance (1 per yr/15 months)	x															
.709	.749	Vault Maintenance (≥200 cubic feet)(1 per yr/15 months)			x													
.603(b)	.751	Prevention of Accidental Ignition (hot work permits)	x															
.603(b)	.225(b)	Welding – Procedure	x															
.603(b)	.227/.229	Welding – Welder Qualification	x															
.603(b)	.243(b)(2)	NDT – NDT Personnel Qualification	x															
.709	.243(f)	NDT Records (Pipeline Life)	x															
.709		Repair: pipe (Pipeline Life); Other than pipe (5 years)	x															

**Comments:**  
 .625: Gas is not odorized.  
 .727: No underwater abandoned facilities.  
 .731(a): Violation written – 3 relief devices not operated during 2009 calendar year and exceeded 15 months.  
 .739: No pressure regulating or limiting stations.  
 .743: No pressure regulating or limiting stations.  
 .749: No vaults ≥ 200 CF

CORROSION CONTROL PERFORMANCE AND RECORDS			S	U	N/A	N/C
.491	.491(a)	Maps or Records	x			
.491	.459	Examination of Buried Pipe when Exposed	x			
.491	.465(a)	Annual Pipe-to-soil Monitoring (1 per yr/15 months)	x			
.491	.465(b)	Rectifier Monitoring (6 per yr/2½ months)	x			
.491	.465(c)	Interference Bond Monitoring – Critical (6 per yr/2½ months)	x			
.491	.465(c)	Interference Bond Monitoring – Non-critical (1 per yr/15 months)	x			

## GAS STORAGE FIELD REVIEW

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CORROSION CONTROL PERFORMANCE AND RECORDS			S	U	N/A	N/C
.491	.465(d)	Prompt Remedial Actions	x			
.491	.465(e)	Unprotected Pipeline Surveys, CP active corrosion areas (1 per 3 cal yr/39 months)			x	
.491	.467	Electrical Isolation (Including Casings)	x			
.491	.469	Test Stations – Sufficient Number	x			
.491	.471	Test Lead Maintenance	x			
.491	.473	Interference Currents			x	
.491	.475(a)	Internal Corrosion; Corrosive Gas Investigation	x			
.491	.475(b)	Internal Corrosion; Internal Surface Inspection; Pipe Replacement	x			
.476(d)	.476	Internal Corrosion Control: Design and construction of transmission line	x			
.491	.477	Internal Corrosion Control Coupon Monitoring (2 per yr/7½ months)	x			
.491	.481	Atmospheric Corrosion Control Monitoring (1 per 3 cal yr/39 months onshore; 1 per yr/15 months offshore)	x			
.491	.483/.485	Remedial: Replaced or Repaired Pipe; coated and protected; corrosion evaluation and actions		x		

**Comments:**

.465(e): No unprotected pipelines.  
.473: No interference currents.  
.483 and .485: Violation noted for not following PSE atmospheric corrosion procedures. (192.13(c))

PART 199 – DRUG and ALCOHOL TESTING REGULATIONS and PROCEDURES			S	U	N/A	N/C
Subparts A - C	Drug & Alcohol Testing & Alcohol Misuse Prevention Program – Use PHMSA Form # 13, PHMSA Drug and Alcohol Questions					

## Recent PHMSA Advisory Bulletins (Last 2 years)

Leave this list with the operator.

<u>Number</u>	<u>Date</u>	<u>Subject</u>
ADB-08-01	May 13, 2008	Pipeline Safety - Notice to Operators of Gas Transmission Pipelines on the Regulatory Status of Direct Sales Pipelines
ADB-08-02	March 4, 2008	Pipeline Safety - Issues Related to Mechanical Couplings Used in Natural Gas Distribution Systems
ADB-08-03	March 10, 2008	Pipeline Safety - Dangers of Abnormal Snow and Ice Build-Up on Gas Distribution Systems
ADB-08-04	June 5, 2008	Pipeline Safety - Installation of Excess Flow Valves into Gas Service Lines
ADB-08-05	June 25, 2008	Pipeline Safety - Notice to Hazardous Liquid Pipeline Operators of Request for Voluntary Adv Notification of Intent To Transport Biofuels
ADB-08-06	July 2, 2008	Pipeline Safety - Dynamic Riser Inspection, Maintenance, and Monitoring Records on Offshore Floating Facilities
ADB-08-07	Jul 31, 2008	PHMSA-RSPA-1997-2426; National Pipeline Mapping System; Notice; Issuance of Advisory Bulletin
ADB-08-08	Nov 24, 2008	Pipeline Safety: Proper Identification of Internal Corrosion Risk; Notice; Issuance of Advisory Bulletin
ADB-09-01	May 21, 2009	Pipeline Safety: Potential Low and Variable Yield and Tensile Strength and Chemical Composition Properties in High Strength Line Pipe.
ADB-09-02	Sep 30, 2009	Weldable Compression Coupling Installation
ADB-09-03	Dec 7, 2009	Pipeline Safety: Operator Qualification (OQ) Program Modifications
ADB-09-04	Jan 14, 2010	Reporting Drug and Alcohol Test Results for Contractors and Multiple Operator Identification Numbers
ADB-10-01	Jan 26, 2010	Pipeline Safety: Leak Detection on Hazardous Liquid Pipelines
ADB-10-02	Feb 3, 2010	Implementation of Revised Incident/Accident Report Forms for Distribution Systems, Gas Transmission and Gathering Systems, and Hazardous Liquid Systems
ADB-10-03	March 24, 2010	Girth Weld Quality Issues Due to Improper Transitioning, Misalignment, and Welding Practices of Large Diameter Line Pipe

For more PHMSA Advisory Bulletins, go to <http://ops.dot.gov/regs/advise.htm>