

GAS STORAGE FIELD REVIEW

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: Al Jones / August 22, 2007	Senior Egr. Review/Date: David Lykken 8/23/2007	Peer Review/Date: Tom Finch	
	Director Approval/Date: Chris Hoidal		
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			
Unit Type & Commodity: Interstate Gas Storage / Natural Gas			
Inspection Type: Standard	Inspection Date(s): 8/ 13-15/ 2007		
PHMSA Representative(s): Al Jones (WUTC)	AFO Days: 3		

Summary:

The inspection included a review of records, control room operations, cathodic protection for the transmission pipeline, casings, and rectifiers. Field inspection of compressor stations included ESD alarm system, gas and fire detectors, and ventilation system. In general, the plant security, ROW, line markers, signs, firefighting equipment, pipe supports, gathering piping and well head piping were all inspected. Numerous rectifiers and pipe-to-soil potentials were taken and found to be in compliance, see field data form for details. A follow-up of previous inspections for atmospheric corrosion at pipe supports was inspected and the slug catcher design was reviewed.

Findings:

No probable violations or areas of concerns noted during this inspection.

GAS STORAGE FIELD REVIEW

Name of Operator: Puget Sound Energy		Unit ID No. ⁽¹⁾ 33875
OP ID No. ⁽¹⁾ 2189		System/Unit Name & Address: ⁽¹⁾
HQ Address: Puget Sound Energy P.O. Box 90868 Bellevue, WA 98009-0868		Jackson Prairie Storage Facility 239 Zandecki Road Chehalis, WA 98532
Co. Official: Stephanie Kreshel	Activity Record ID No.:	
Phone No.: 425-462-3734	Phone No.: 360-262-3365	
Fax No.: 425-462-3770	Fax No.:	
Emergency Phone No.: 1-888-225-5773	Emergency Phone No.: 1-888-225-5773	
Persons Interviewed	Title	Phone No.
James Janson	Manager	360-262-3365
Mark Anders	Manager Technical Services	360-262-3365
Rick Braaten	Supervisor	360-262-3365
Don Hunt	Compliance Coordinator	425-462-3715
PHMSA Representative(s) ⁽¹⁾ Al Jones (WUTC) Inspection Date(s) ⁽¹⁾ August 13-15, 2007		
Company System Maps (Copies for Region Files): At facility		

Counties of Operation: (list each field separately)
 Jackson Storage facility is located in Lewis County, Washington.

Storage Field(s) Description: (list each field separately)
 Jackson Storage gas storage is located in natural sandstone formation saturated with salt water approximately 3,200 acres in size and approximately 1.5 miles below the surface. The top of the repository is sealed by a natural formation of clay and shale layers. The current storage capacity will be expanded approximately 42% with the addition of five new injection/withdrawal wells this year and another five wells in 2008. A new compressor, filter coalescer unit, and SCADA system are planned for 2008. Gas moves in or out of the repository via underground piping and between the plant and Williams pipeline via four transmission lines consisting of 4,6,10, and 16-inch diameter pipes approximately 9,600 linear feet each. All piping and well casings are cathodically protection by 16 rectifiers.

Inspection Summary:
 Numerous rectifier and pip-to-soil potentials readings were taken and found to be in compliance (see field data report). A follow-up to the previous inspections for atmospheric corrosion at pipe supports and slug catcher design were inspected and reviewed with PSE staff.

¹ Information not required if included on page 1.
 Form 12 Gas Storage Field Review (Rev. 03/02/07 through Amdt. 192-103)

GAS STORAGE FIELD REVIEW

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	<u>0</u>	<u>14.4 Miles</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>

PIPE SPECIFICATIONS (2" AND LARGER)						
Diameter(s)	<u>14-inch</u>	<u>16-inch</u>	<u>20-inch</u>	<u>24-inch</u>		
Pipe Grade(s)	<u>X-46</u>	<u>X-52</u>	<u>X-56</u>	<u>X-70</u>		
Wall Thickness(s)	<u>0.250 inch</u>	<u>0.312 inch</u>	<u>0.375 inch</u>	<u>0.250 inch</u>		
Footage/Mileage	<u>9,600 ft</u>	<u>9,600 ft</u>	<u>9,600 ft</u>	<u>9,600 ft</u>		

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:	<u>15% HCL</u>
Type(s) of inhibitors used with the acid(s):	<u>Varies</u>
Frequency of the treatments: <u>Rare</u>	Volume of acid per treatment: <u><600 gallons</u>
Well cleanup procedure following treatment:	<u>Flowed back into the well line</u>
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:	<u>Nothing specific</u>

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:	<u>N/A</u>
Type(s) of inhibitors used with the fracturing fluid(s):	<u>N/A</u>
Frequency of the treatments: <u>N/A</u>	Amount of sand per treatment: <u>N/A</u>
Well cleanup procedure following treatment:	<u>N/A</u>
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:	<u>N/A</u>

GAS STORAGE FIELD REVIEW

GAS and LIQUID HANDLING FACILITIES

GAS COMPRESSION

Location of compressors: Jackson Prairie Compressor Station

Number, Size (HP), and Date of Installation of Units:

C-1 670HP 10/65 Walkinshaw reciprocating engine
C-2 1,000HP 11/66 Saturn turbine/compressor unit
C-3 1,000HP 9/66 Saturn turbine/compressor unit
C-4 1,000HP 11/66 Saturn turbine/compressor unit
C-5 1,300HP 12/68 Saturn turbine/compressor unit
C-6 4,417HP 11/73 Centaur turbine/compressor unit
C-7 4,417HP 11/75 Centaur turbine/compressor unit
C-8 7,000HP 11/99 Taurus turbine/compressor unit
IR-1 145HP 1/01 Caterpillar engine
IR-2 145HP 1/02 Caterpillar engine

GAS DEHYDRATION

Location of dehydration units: Jackson Prairie Compressor Station

Type(s) of dehydration process used: Glycol, bubble cap tray, triethylene glycol at 850 MMCF/Day.

Number of dehydration units: 12 towers

Dehydration capacity: 1 Billion Cubic Feet per Day

GAS SWEETENING (Acid Gas Treating)

Location of sweetening units: N/A

Type(s) of sweetening process used: N/A

Number of sweetening units: N/A

Sweetening capacity: N/A

GAS / LIQUID SEPARATION

SCRUBBERS / SEPARATORS: Yes

Location of scrubbers/separators: Two-Phase separator at each gas well and three vortex separators at the plant.

Type(s) of scrubbers/separators used: 2-phase

Number of scrubbers/separators: 46

Separation capacity: 20 to 80 million cubic feet per day

DRIPS: Yes

Location of drips: Station

Type(s) of drips used: Slug-catcher

Number of drips: One

Frequency of draining or blowing drips: As needed

GAS STORAGE FIELD REVIEW

FIELD OPERATING PARAMETERS

PRESSURES, RATES and TEMPERATURES

	Pressure, psi		Flow Rate, MMcf/day		Temperature, °F	
	Injection	Withdrawal	Injection	Withdrawal	Injection	Withdrawal
Maximum	<u>855</u>	<u>880</u>	<u>450</u>	<u>1 Bcf</u>	<u>110</u>	<u>110</u>
Maximum	<u>370</u>	<u>380</u>	<u>10</u>	<u>10</u>	<u>40</u>	<u>40</u>

Maximum Allowable Operating Pressure (Field):

WATER, CO₂, and O₂ CONTENT

	Water, lbs./MMcf	CO ₂ ,	H ₂ S, ppm	O ₂ , %
Injection Cycle	<u>7</u>	<u>0.04%</u>	<u>0</u>	<u>Negligible</u>
Withdrawal Cycle	<u>20</u>	<u>0.04%</u>	<u>0</u>	<u>Negligible</u>

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 over the past 5 years? 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?
N/A

FAILURE/RUPTURES

Have any failures occurred over the past 5 years? Yes No Number of failures: 0

Type(s) of failures that have occurred:
N/A

Cause(s) of the failures:
N/A

Location(s) of the failures:
N/A

Has a trend analysis been performed? Yes No

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

LINE REPLACEMENTS

Have any lines been replaced over the past 5 years? Yes No Number of replacements:

Type(s) of replacements:
N/A

Location(s) of the replacements:
N/A

Reason(s) for replacements:
N/A

LINE REPAIRS

GAS STORAGE FIELD REVIEW

FIELD OPERATING AND MAINTENANCE HISTORY			
Have any lines been repaired over the past 5 years?		<input type="checkbox"/> Yes	<input checked="" type="checkbox"/> No
Number of repairs:			
Type(s) of repairs: <u>N/A</u>			
Location(s) of the repairs: <u>N/A</u>			
Reason(s) for the repairs: <u>N/A</u>			
VALVE REPLACEMENTS			
Have any valves been replaced over the past 5 years?		<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No
Number of replacements:			1
Type(s) of valve replacements: One valve was maintained and another valve replaced, including: A 3-inch diameter Cameron Ball valve was replaced. The valve is used for equalization across a 36-inch valve. The Cameron valve was replaced because the body is a welded unit. A 14-inch Grove T-ball valve was maintained by the manufacture representative. The valve stem and packing were replaced.			
Location(s) of the replacements: The Cameron valve is located on the station side at the slug catcher. The Grove valve is located at the slug catcher.			
Reason(s) for the replacements: The Cameron was leaking at the internal stem seal. The Grove was leaking at the stem seal.			
GAS and LIQUID HANDLING FACILITY UPSETS			
	Gas Dehydration Units	Gas Sweetening Units	Separators
Number of upsets – past 3 years	1	0	1
Cause(s) of the upsets: <u>A slug of water from Zone 9 spilled approximately 15 gallons of oil effecting the east coaleser unit.</u>			
Has a trend analysis been performed?		<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No
If a trend analysis has been done, what do the results indicate? <u>The relief valve at the coalescer unit was relocated.</u>			

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: <u>-850mV, On</u>					
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: <u>N/A</u>					
Amount of bare of ineffectively coated pipe: <u>N/A</u>					
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 type="checkbox"/> Yes	<input checked="" type="checkbox"/> No

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EXTERNAL CORROSION

Remedial measures taken to mitigate corrosion:
Corrosion coupon at the slug catcher was installed.

INTERNAL CORROSION

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

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 checked="" type="checkbox"/> Yes <input type="checkbox"/> No	Leak surveys <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
Water samples <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	Instrumental inspection surveys <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
Solids samples <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	

CORROSION COUPONS

Frequency coupons are analyzed:

Semi annually.

Location(s) where coupons are installed:

In Slug-catcher.

GAS SAMPLES

Frequency of sampling: As needed.

Location(s) where the samples taken:

At wellheads.

Are the gas samples analyzed for:

Carbon dioxide (CO ₂)	<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No
Hydrogen sulfide (H ₂ S)	<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No
Oxygen (O ₂)	<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No
Water vapor	<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No

Amount of the following present in the gas:

Carbon dioxide (CO ₂)	<u>0.04%</u>
Hydrogen sulfide (H ₂ S)	<u>Negligible</u>
Oxygen (O ₂)	<u>Negligible</u>
Water vapor	<u>Negligible</u>

What carbon dioxide (CO₂) partial pressure criteria are used to establish carbon dioxide (CO₂) corrosivity ranges?

N/A, not done.

What is the carbon dioxide (CO₂) corrosivity ranges?

Not established.

What is the carbon dioxide (CO₂) partial pressure? Insignificant.

WATER/LIQUIDS SAMPLES

Frequency of sampling: As needed, not typically taken and only from the well field.

Locations where the samples are taken:

At wellheads.

What constituents are the water samples analyzed for? (Refer to the Water Analysis Checklist)

Concentration of the following present in water:

Amount of the following gases dissolved in the water:

GAS STORAGE FIELD REVIEW

INTERNAL CORROSION

Iron	(Fe ⁺⁺)	<u>0.25 – 2.5 mg/l</u>	Carbon dioxide	(CO ₂)	<u>Negligible</u>
Manganese	(Mn ⁺⁺)	<u>100 – 500 mg/l</u>	Hydrogen sulfide	(H ₂ S)	<u>Negligible</u>
Chlorides	(Cl ⁻)	<u>20,000 mg/l</u>	Oxygen	(O ₂)	<u>640 – 1,200 mg/l</u>
Sulfates	(SO ₄ ⁻)	<u>0.4 – 8 mg/l</u>			

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

Locations where the samples taken:
N/A, sample are not collected.

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

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

Is the volume of solids increasing or decreasing between pig runs?
N/A, solids samples are not collected.

Comments:

INSTRUMENTED INSPECTION SURVEYS

Frequency surveys are conducted: N/A, instrumented surveys are not done.

Lines that have been surveyed and when the survey was conducted:
N/A, instrumented surveys are not done.

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? N/A, no inhibitor program.

Type(s) of treatment method used: Batch Continuous

Type(s) of inhibitors used:
N/A, no 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:
No maintenance pigging program performed by operator.

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CONTROLLING GAS VELOCITY – INTERNAL CORROSION AND EROSION	
Have target flow rates been determined for the field piping system?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
Are injection/withdrawal flow rates kept within the targeted flow rates, to minimize sediment and water build-up, and to manage erosion?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
Has erosion been observed during replacement of components (lines, valves, fittings, etc.)?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
Locations where erosion has been found: <u>N/A, no internal corrosion issues experienced at facility.</u>	
Remedial measures taken to mitigate erosion: <u>N/A, no internal corrosion erosion issues experienced at facility.</u>	

ATMOSPHERIC CORROSION	
Are corrosion monitoring procedures established for the field piping and related storage field facilities?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
Location(s) where corrosion has been found: <u>Surface rust located between the pipe and pipe supports.</u>	
Remedial measures taken to mitigate corrosion: <u>A di-electric insulator has been place between the pipe and pipe supports.</u>	

SAFETY DEVICES and SYSTEMS

SURFACE FACILITIES	
Has a system safety analysis of the field piping and related storage facilities been performed:	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
Has a safety analysis function evaluation chart for the field piping and related storage field facilities been prepared?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
PRESSURE SAFETY DEVICES:	
COMPRESSORS	
Is each compressor, per 49 CFR 192.169, equipped with pressure safety devices for overpressure protection? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	
Pressure protection provided by:	Location of pressure safety devices:
Primary <u>SCADA system</u>	Primary <u>Control room set points</u>
Secondary <u>Safety relief valves</u>	Secondary <u>Exit piping.</u>
PRESSURE VESSELS	
Is the working pressure of each pressure vessel (dehydrator, scrubber, etc.) greater than the MAOP? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	
Is each pressure vessel equipped with pressure safety devices for overpressure protection? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	

GAS STORAGE FIELD REVIEW

SURFACE FACILITIES

SURFACE FACILITIES	
Pressure protection provided by:	Location of pressure safety devices:
Primary <u>Reservoir pressure limitation.</u>	Primary <u>Relief valve on each vessel.</u>
Secondary <u>Relief valve</u>	Secondary <u>Exit piping.</u>
HEADERS, LATERALS and WELL LINES	
Are the headers, laterals and well lines equipped with pressure safety devices for overpressure protection? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	
Pressure protection provided by:	Location of pressure safety devices:
Primary <u>Relief Valves</u>	Primary <u>Station piping</u>
Secondary <u>N/A</u>	Secondary <u>N/A</u>
GAS DETECTION SAFETY DEVICES:	
Is each compressor, per 49 CFR 192.736, building equipped with gas detection safety devices? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	
Are other buildings that contain gas handling equipment equipped with gas detection safety devices? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	
Type(s) of gas detection safety devices: <input type="checkbox"/> Combustible gas (L.E.L.) <input type="checkbox"/> Hydrogen Sulfide (H ₂ 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	
FIRE DETECTION SAFETY DEVICES:	
Is each compressor building equipped with fire detection safety devices? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	
Are other buildings that contain gas handling equipment equipped with fire detection safety devices: <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	
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 type="checkbox"/> Other:	
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	
EMERGENCY SHUTDOWN SYSTEM:	
Is each compressor station, per 49 CFR 192.167, equipped with a remote controlled emergency shutdown system? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	
Does the gas detection system activate the compressor station emergency shutdown system? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	
Does the fire detection system activate the compressor station emergency shutdown system? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	

WELLS

WELLS	
Is each well equipped with a well storage safety valve? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	
If not, are there plans to equip each well with a well storage safety valve? <input type="checkbox"/> Yes <input type="checkbox"/> No	
Reasons why wells should not be equipped with well storage safety valve(s)?	

GAS STORAGE FIELD REVIEW

ADDITIONAL COMMENTS

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GAS STORAGE FIELD REVIEW

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 ⁺	<input checked="" type="checkbox"/>	<input type="checkbox"/>		Chloride		Cl ⁻	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
Potassium		K ⁺	<input checked="" type="checkbox"/>	<input type="checkbox"/>		Sulfate		SO ₄ ⁻	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
Calcium		Ca ⁺⁺	<input checked="" type="checkbox"/>	<input type="checkbox"/>		Carbonate		CO ₃ ⁻	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
Magnesium		Mg ⁺⁺	<input checked="" type="checkbox"/>	<input type="checkbox"/>		Bicarbonate		HCO ₃ ⁻	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
Iron		Fe ⁺⁺	<input checked="" type="checkbox"/>	<input type="checkbox"/>		Hydroxide		OH ⁻	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
Barium		Ba ⁺⁺	<input type="checkbox"/>	<input checked="" type="checkbox"/>		Dissolved Oxygen		O ₂	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
Strontium		Sr ⁺⁺	<input type="checkbox"/>	<input checked="" type="checkbox"/>		Dissolved Carbon Dioxide		CO ₂	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
Manganese		Mn ⁺⁺	<input checked="" type="checkbox"/>	<input type="checkbox"/>		Dissolved Hydrogen Sulfide		H ₂ S	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
Lead			<input checked="" type="checkbox"/>	<input type="checkbox"/>		Arsenic			<input checked="" type="checkbox"/>	<input type="checkbox"/>	
Zinc			<input checked="" type="checkbox"/>	<input type="checkbox"/>		Copper			<input checked="" type="checkbox"/>	<input type="checkbox"/>	

Other	Does Operator test for . . .		Operator's "threshold"	Other	Does Operator test for . . .		Operator's "threshold"
	Yes	No			Yes	No	
Acidity	<input type="checkbox"/>	<input checked="" type="checkbox"/>		Alkalinity	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
pH	<input type="checkbox"/>	<input checked="" type="checkbox"/>		Salinity	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
Total Dissolved Solids (TDS)	<input checked="" type="checkbox"/>	<input type="checkbox"/>		Acid-producing Bacteria	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
Sulfate-reducing Bacteria	<input type="checkbox"/>	<input checked="" type="checkbox"/>					

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.

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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.

PIPELINE INSPECTION (Field)		S	U	N/A	N/C
.179	Valve Protection from Tampering or Damage	S			
.463	Cathodic Protection	S			
.465	Rectifiers	S			
.479	Pipeline Components Exposed to the Atmosphere	S			
.605	Knowledge of Operating Personnel	S			
.707	ROW Markers, Road and Railroad Crossings	S			
.719	Pre-pressure Tested Pipe (Markings and Inventory)	S			
.739	Pressure Limiting and Regulating Devices (Mechanical)	S			
.743	Pressure Limiting and Regulating Devices (Capacities)	S			
.745	Valve Maintenance	S			
.751	Warning Signs	S			
.801 - .809	Operator Qualification - Use PHMSA Form 15 Operator Qualification Field Inspection Protocol Form	S			

Comments:

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

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.

COMPRESSOR STATIONS INSPECTION (Field)		S	U	N/A	N/C
(Note: Facilities may be "Grandfathered")					
.167(c)	Are ESDs on platforms designed to actuate automatically by...				
	- For unattended compressor stations, when:				
	▪ The gas pressure equals MAOP plus 15%?	S			
	▪ An uncontrolled fire occurs on the platform?	S			
	- For compressor station in a building, when				
	▪ An uncontrolled fire occurs in the building?	S			
	▪ Gas in air reaches 50% or more of LEL in a building with a source of ignition (facility conforming to NEC Class 1, Group D is not a source of ignition)?	S			
.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.	S			
(b)	Do the compressor station prime movers (other than electrical movers) have over-speed shutdown?	S			
(c)	Do the compressor units alarm or shutdown in the event of inadequate cooling or lubrication of the unit(s)?	S			
(d)	Are the gas compressor units equipped to automatically stop fuel flow and vent the engine if the engine is stopped for any reason?	S			
(e)	Are the mufflers equipped with vents to vent any trapped gas?	S			
.173	Is each compressor station building adequately ventilated?	S			
.457	Is all buried piping cathodically protected?	S			
.481	Atmospheric corrosion of aboveground facilities	S			
.603	Does the operator have procedures for the start-up and shut-down of the station and/or compressor units?	S			
	Are facility maps current/up-to-date?	S			
.615	Emergency Plan for the station on site?	S			
.619	Review pressure recording charts and/or SCADA	S			
.707	Markers	S			
.731	Overpressure protection – reliefs or shutdowns	S			
.735	Are combustible materials in quantities exceeding normal daily usage, stored a safe distance from the compressor building?	S			
	Are aboveground oil or gasoline storage tanks protected in accordance with NFPA standard No. 30?	S			
.736	Gas detection – location	S			

Comments:

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

GAS STORAGE FIELD REVIEW

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 If an item is marked U, N/A, or N/C, an explanation must be included in this report.

CONSTRUCTION PERFORMANCE AND RECORDS		S	U	N/A	N/C
.225	Test Results to Qualify Welding Procedures			N/A	
.227	Welder Qualification			N/A	
.241 (a)	Visual Weld Inspector Training/Experience			N/A	
.243 (b)(2)	Nondestructive Technician Qualification			N/A	
(c)	NDT procedures			N/A	
(f)	Total Number of Girth Welds			N/A	
(f)	Number of Welds Inspected by NDT			N/A	
(f)	Number of Welds Rejected			N/A	
(f)	Disposition of each Weld Rejected			N/A	
.303	Construction Specifications			N/A	
.325	Underground Clearance			N/A	
.327	Amount, Location, Cover of each Size of Pipe Installed			N/A	
.455	Cathodic Protection			N/A	

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)	S			
.603(b)	.605(c) Abnormal Operations	S			
.603(b)	.605(b)(3) Availability of construction records, maps, operating history to operating personnel	S			
.603(b)	.605(b)(8) Periodic review of personnel work – effectiveness of normal O&M procedures	S			
.603(b)	.605(c)(4) Periodic review of personnel work – effectiveness of abnormal operation procedures	S			
.709	.614 Damage Prevention (Miscellaneous)	S			
.709	.609 Class Location Study (If Applicable)	S			
.603(b)	.615(b)(1) Location Specific Emergency Plan	S			
.603(b)	.615(b)(2) Emergency Procedure training, verify effectiveness of training	S			
.603(b)	.615(b)(3) Employee Emergency activity review, determine if procedures were followed.	S			
.603(b)	.615(c) Liaison Program with Public Officials	S			
.603(b)	.616 Public Education	S			
.517	Pressure Testing	S			
.709	.619 Maximum Allowable Operating Pressure (MAOP)	S			
.709	.625 Odorization of Gas			N/A	
.709	.705 Patrolling (Refer to Table Below)	S			

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)	S			
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Class Location	Required	Not Exceed
1 and 2	1/yr	15 months
3	2/yr*	7½ months
4	4/yr*	4½ months

* Leak detector equipment survey required for lines transporting un-odorized gas.

GAS STORAGE FIELD REVIEW

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OPERATIONS and MAINTENANCE PERFORMANCE AND RECORDS			S	U	N/A	N/C
.603b/.727g	.727	Abandoned Pipelines; Underwater Facility Reports			N/A	
.709	.731(a)	Compressor Station Relief Devices (1 per yr/15 months)	S			
.709	.731(c)	Compressor Station Emergency Shutdown (1 per yr/15 months)	S			
.709	.736(c)	Compressor Stations – Detection and Alarms (Performance Test)	S			
.709	.739	Pressure Limiting and Regulating Stations (1 per yr/15 months)			N/A	
.709	.743	Pressure Limiting and Regulator Stations – Capacity (1 per yr/15 months)			N/A	
.709	.745	Valve Maintenance (1 per yr/15 months)	S			
.709	.749	Vault Maintenance (≥200 cubic feet)(1 per yr/15 months)			N/A	
.603(b)	.751	Prevention of Accidental Ignition (hot work permits)			N/A	
.603(b)	.225(b)	Welding – Procedure			N/A	
.603(b)	.227/.229	Welding – Welder Qualification			N/A	
.603(b)	.243(b)(2)	NDT – NDT Personnel Qualification			N/A	
.709	.243(f)	NDT Records (Pipeline Life)			N/A	
.709		Repair: pipe (Pipeline Life); Other than pipe (5 years)			N/A	

Comments:

Since the last inspection, there has been NO, telephonic incidents, safety related conditions, abandoned facilities, construction or repair work done, odorization, regulator station, and vaults at the facility.

CORROSION CONTROL PERFORMANCE AND RECORDS			S	U	N/A	N/C
.491	.491(a)	Maps or Records	S			
.491	.459	Examination of Buried Pipe when Exposed			N/A	
.491	.465(a)	Annual Pipe-to-soil Monitoring (1 per yr/15 months)	S			
.491	.465(b)	Rectifier Monitoring (6 per yr/2½ months)	S			
.491	.465(c)	Interference Bond Monitoring – Critical (6 per yr/2½ months)			N/A	
.491	.465(c)	Interference Bond Monitoring – Non-critical (1 per yr/15 months)			N/A	
.491	.465(d)	Prompt Remedial Actions	S			
.491	.465(e)	Unprotected Pipeline Surveys, CP active corrosion areas (1 per 3 cal yr/39 months)			N/A	
.491	.467	Electrical Isolation (Including Casings)	S			
.491	.469	Test Stations – Sufficient Number	S			
.491	.471	Test Lead Maintenance	S			
.491	.473	Interference Currents	S			
.491	.475(a)	Internal Corrosion; Corrosive Gas Investigation	S			
.491	.475(b)	Internal Corrosion; Internal Surface Inspection; Pipe Replacement			N/A	
.491	.477	Internal Corrosion Control Coupon Monitoring (2 per yr/7½ months)	S			
.491	.481	Atmospheric Corrosion Control Monitoring (1 per 3 cal yr/39 months onshore; 1 per yr/15 months offshore)	S			
.491	.483/.485	Remedial: Replaced or Repaired Pipe; coated and protected; corrosion evaluation and actions	S			

Comments:

Since the last inspection, there has been NO exposed pipe, interference bonds, and unprotected pipes at the facility.

Recent PHMSA Advisory Bulletins (Last 2 years)

Leave this list with the operator.

<u>Number</u>	<u>Date</u>	<u>Subject</u>
ADB-05-01	January 21, 2005	Pipeline Safety: Semi-Annual Reporting of Performance Measures for Gas Transmission Pipeline Integrity Management
ADB-05-02	April 6, 2005	Pipeline Safety: Strapping Table Calibration for Pipeline Breakout Tank Operators
ADB-05-03	May 23, 2005	Pipeline Safety: Planning for Coordination of Emergency Response to Pipeline Emergencies
ADB-05-04	July 29, 2005	Integrity Management Notifications for Gas Transmission Lines
ADB-05-05	August 10, 2005	Pipeline Safety Advisory Bulletin - Inspecting and Testing Pilot-Operated Pressure Relief Valves
ADB-05-06	August 11, 2005	ADB-05-06 - Pipeline Safety - Countermeasures to Prevent Human Fatigue in the Control Room
ADB-05-07	September 7, 2005	Pipeline Safety Advisory - Potential for damage to Natural Gas Distribution Pipeline Facilities Caused by the Passage of Hurricane Katrina
ADB-05-08	September 7, 2005	Pipeline Safety Advisory - Potential for damage to Pipeline Facilities Caused by the Passage of Hurricane Katrina
ADB-06-01	January 17, 2006	Pipeline Safety: Notice to Operators of Natural Gas and Hazardous Liquid Pipelines To Integrate Operator Qualification Regulations into Excavation Activities
ADB-06-02	June 16, 2006	Submission of Public Awareness Programs for Review
ADB-06-03	November 22, 2006	Pipeline Safety-Notice to Operators of Natural Gas and Hazardous Liquid Pipelines to Accurately Locate and Mark Underground Pipelines Before Construction-Related Excavation Activities Commence Near the Pipelines
ADB-06-04	December 28, 2006	Pipeline Safety: Lessons Learned From a Security Breach at a Liquefied Natural Gas Facility

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