110390

POST INSPECTION MEMORANDUM

Inspector: Al Jones/WUTC
Reviewed: Joe Subsits/WUTC 4/5/2012
Peer Reviewed: RR
Follow-Up Enforcement: No Violation ✓
~~PCP* PCO* NOA WL LOC~~
Director Approval* CTH 12/18/12

Date: April 4, 2012

Operator Inspected: **OPID: 15014** **Region:** Western
Gas Transmission Northwest Corporation (GTN)
U.S. Western Pipe Region
1400 SW 5th Ave
Suite 900
Portland, OR 97201

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JAN 08 2013
State of Washington
UTC
Pipeline Safety Program

Unit Address:
Rosalia District
201 West North River Drive
Spokane, WA 99201

Unit Inspected: Rosalia District **Unit ID:** 66685
Unit Type: Interstate Natural Gas
Inspection Type: ~~Standard Inspection Field Follow-Up~~ I-05 Specialized (Follow-up)
Record Location: Spokane, WA I-07 Gas Field IMP
Inspection Dates: March 27-30, 2012
AFOD: Four I-05 2 DAYS; I-07 2 DAYS)
SMART Activity Number: 141592 142178

Operator Contact: Kurt Smith, Pipe Regulatory Specialist
Phone: (509) 533-2831 **Fax:** (509) 546-8825 **Emergency:** (800) 447-8066

Unit Description:
The Rosalia District is located in Eastern Washington in Spokane and Whitman Counties; extending south from the Idaho/Washington border to the Snake River crossing. The pipeline is approximately 100 miles in length. The transmission lines are primarily in Class-1 Location, except the Spokane Valley with about 14 miles of Class-2 Location and about 7 miles of Class-3 Location. The District includes a compressor station at Rosalia, various main line block valves, CP test sites, and rectifier stations.

Facilities Inspected:
The portion of the District inspected included the 36-inch (A-Line) and 42-inch (B-Line) diameter pipelines south of the Spokane Gate Station to the Spokane Valley (MP 113.6). The Field Data Report includes native values as a follow-up to the November 2011standard

inspection. On March 26, 2012 the local rectifiers were turned off and native values were taken on March 29, 2012. See Exhibit-A for annual CP data from 2007 to 2011 provided by Rich Christman, GTN's Corrosion Specialist. The table includes the native value for MP 113.6.

Persons Interviewed:

Kurt Smith	Pipe Regulatory Specialist	(509) 533-2832
Rich Christman	Corrosion Specialist	(208) 265-2164
James Olson	Multi Skills Technician	(509) 523-4211

Probable Violations/Concerns:

None.

Follow up on the history of prior offenses that are still open:

Prior Offenses (for the past 5 years)		
CPF #	**What type of open enforcement action(s)?**	**Status of the regulations(s) violated (Reoccurrence Offenses, Implement a NOA Revision, Completion of PCO or CO, and etc...)**

Recommendations:

The NOPV for the 2011 inspection has been remediated with updated 2008 native survey.
Historical CP data at MP 113.6 has been in compliance with CFR 49, Part 129.
Maintain normal inspection cycle.

Comments:

During the 2011 standard inspection, the CP off values for the A and B lines at MP 110.1 and MP 110.8 were less than -850 vDC on and less than 100 mv shift criteria with respect to the 2006 native survey. Since the inspection, GTN has updated their database to 2008 native values. See Exhibit-A, for annual survey data from 2007 to 2011. In summary, all CP values at MP 110.1 and 110.8 test stations were in compliance with 100mv shift criteria using the 2008 native values, except 2008 data.
Also, Exhibit-A includes the annual CP data for test station at MP 113.6 from 2007 to 2011. In summary, MP 113.6 test station was in compliance with -850 mv on criteria.

Attachments:

PHMSA Form 16 - Gas IMP Field Verification Inspection
Field Data Collection Form
Exhibit A – 2007-2011 CP Data
Exhibit B – Beck Rd Rectifier Data 2007-2011
Exhibit C – Baker Rd-Spangle Rectifier Data 2007-2011

Version Date: 5/5/08

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: Gas Transmission Northwest Corporation (GTN)
Op ID: 15014

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
	3A	Preventive & Mitigative – additional measures evaluated for HCAs
	3B	Preventive & Mitigative – automatic shut-off valves
	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:

Gas Transmission Northwest Corporation (GTN)

Headquarters Address:	1400 SW 5th Ave Suite 900 Portland, OR 97201
Company Official:	Ken Leier, Regional Director
Phone Number:	**509-533-2831**
Fax Number:	**509-533-2825**
Operator ID:	**15014**

Persons Interviewed	Title	Phone No.	E-Mail
Kurt Smith	Compliance Specialist Primary Contact	509-546-8865	kurt_smith@transcanada.com
James Olson	Multi-Skills Technician / Corrosion Tech	509-533-4311	James_olson@transcanada.com
Rich Christman	Corrosion Specialist	208-304-5700	Rich_christman@transcanada.com

OPS/State Representative(s): Al Jones/WUTC **Date(s) of Inspection:** March 27-30, 2012

Inspector Signature: *Al Jones* Date: April 4, 2012

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 portion of the Rosalia District inspected included the 36-inch (A-Line) and 42-inch (B-Line) diameter pipelines south of the Spokane Gate Station to the Spokane Valley (MP 113.6). The Field Data Report includes native values as a follow-up to the November 2011standard inspection. On March 26, 2012 the local rectifiers were turned off and native values were taken on March 29, 2012. See Exhibit-A for annual CP data from 2007 to 2011 provided by Rich Christman, GTN's Corrosion Specialist. Also, the table includes the native value for MP 113.6.

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 follow-up inspection site includes the rectifier at MP 105.7 on Beck Rd. in Idaho, native CP data at MP 110.2, MP 110.8, and MP 113.6.

Summary:
The NOPV for the 2011 inspection has been remediated with updated 2008 native survey.
In summary, all CP values at MP 110.1 and 110.8 test stations were in compliance with 100mv shift criteria using the 2008 native values, except 2008 data. And at MP 113.6 the test station was in compliance with -850 mv on criteria. See Exhibit-A for annual CP data from 2007 to 2011 and Exhibit-B and Exhibit-C for rectifier history from 2007 to 2011.

Findings:
During the 2011 standard inspection the CP values for the A and B lines at MP 110.1 and MP 110.8 were less than -850 vDC on and less than 100 mv shift criteria with respect to the 2006 native survey. Since the inspection, GTN has updated their database to 2008 native values. See Exhibit-A, for annual survey data from 2007 to 2011.

Key Documents Reviewed:

Document Title	Document No.	Rev. No	Date
Exhibit-A CP data 2007-2011			**3/28/2012**
Exhibit-B Beck Rd Rectifier data 2007-2011			**3/28/2012**
Exhibit-C Baker Rd Rectifier data 2007-2011			**3/28/2012**

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.			**X**	
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.				*[Note: Add location specific information, as appropriate.]*
Other:				

1B. Hydrostatic Pressure Testing	Satisfactory	Unsatisfactory	N/C	Notes:
Verify that hydrostatic pressure tests complied with Part 192 Subpart J requirements.			**X**	
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			**X**	
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.			**X**	
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.			X	
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.				Cathodic Protection readings of pipe to soil at dig site (if available): On Potential: _____ mV Off Potential: _____ mV *[Note: Add location specific information and note whether CP readings were from the surface or from the pipe following exposure, as appropriate.]*
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.			X	
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.				Cathodic Protection readings of pipe to soil at dig site (if available): On Potential: _____ mV Off Potential: _____ mV *[Note: Add location specific information and note whether CP readings were from the surface or from the pipe following exposure, as appropriate.]*
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	
Verify that P & M measures regarding threats due to third party damage are being implemented: [§192.915(c), §192.935(b)(1)(iv)]:				
Confirm the use of qualified personnel for marking, locating, and direct supervision of known excavation work, as appropriate.				
Confirm the use of qualified personnel for monitoring of excavations conducted on covered pipeline segments by pipeline personnel, as appropriate.				
Other:				*[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	
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	
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.				*[Note: Add location specific information, as appropriate.]*

4B. Field Inspection for Verification of Anomaly Digs	Satisfactory	Unsatisfactory	N/C	Notes:
Verify repair areas, ILI verification sites, etc.			X	
Document the anomaly dig sites observed and reviewed as part of this field activity and the actions taken by the operator.				*[Note: Add location specific information, as appropriate.]*

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			Review records for CP readings and rectifier output values for 2007 through 2011. Field checked native pipe-to-soil values at MP 110.2, MP 110.8, and MP 113.6.
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.				Cathodic Protection readings of pipe to soil at dig site (if available): On Potential: _____ mV Off Potential: _____ mV
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.				*[Note: Add location specific information and note whether CP readings were from the surface or from the pipe following exposure, as appropriate.]*

4D. Field inspection for general system characteristics	Satisfactory	Unsatisfactory	N/C	Notes:
Through field inspection determine overall condition of pipeline and associated facilities for a general estimation of the effectiveness of the operator's IMP implementation.	X			Field reviewed the pipeline right-of-way and line markers between MP 105.7 and MP 110.8.
Evaluate condition of the ROW of inspection site to ensure minimum code requirements are being met, as appropriate.				
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 *[Note: Note whether CP readings were from the surface or from the pipe following exposure, as appropriate.]*
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 *(Note: attach photographs, sketches, etc., as appropriate)*:

Field Data Collection

(From 2011 Standard Inspection Docket #110390)

Company: Gas Transmission Northwest Corporation (GTN)
Unit: Rosalia District
Inspector: Al Jones, UTC Staff

Pipe-to-soil potential readings and other items

Please note: The field data in this report are native values and a follow-up to the November 2011 standard inspection. The rectifiers were off the previous two days before collecting data. The A and B pipelines are 36 and 42-inch diameter, respectively. See Exhibit A for annual CP data from 2007 to 2011 provided by Rich Christman, GTN's Corrosion Specialist.

The data includes:
- MP 110.2 and MP 110.8 in response to a NOPV and
- MP 113.6 in response to PHMSA request for additional information.

Date	Location	Pipe (Volts DC)	Casing (Volts DC)	Comments
3/29/2012	MP 105.7 Rectifier	0		Located at Beck Rd., Idaho
3/29/2012	MP 110.2 A-Line	-0.689		Native Potential
	B-Line	-0.706		" "
3/29/2012	MP 110.8 A-Line	-0.639	-0.518	Native Potential
	B-Line	-0.671		" "
3/29/2012	MP 113.6 A-Line	-0.557		Native Potential
	B-Line	-0.545		" "

A - Line

Name Plate Chainage	Most Recent Depol Data	Depol Date	ON Potential	OFF Potential	Date/Time	ON Potential	OFF Potential	Date/Time	ON Potential	OFF Potential	Date/Time	ON Potential	OFF Potential	Date/Time	ON Potential	OFF Potential	Date/Time
5005201+110.200-TS			1,072.00		01-Sep-2007 00:00	791.00		01-Oct-2008 00:00	1,440.75		19-Sep-2009 21:41	1,424.63		18-Aug-2010 17:00	1,674.06		30-Aug-2011 15:53
	0.528	2012-02-08		970.00			592.00			1,226.41	19-Sep-2009 21:41		668.67	18-Aug-2010 17:00		747.93	30-Aug-2011 15:53
5005201+110.800-TS			1,108.00		01-Sep-2007 00:00	766.00		01-Oct-2008 00:00	1,462.21		19-Sep-2009 21:54	1,400.65		18-Aug-2010 17:14	1,710.96		30-Aug-2011 16:09
	0.487	2012-02-08		1,015.00			566.00			1,243.51	19-Sep-2009 21:54		640.49	18-Aug-2010 17:14		792.07	30-Aug-2011 16:09
5005201+113.600-TS			1,100.00		01-Sep-2007 00:00	1,074.00		01-Oct-2008 00:00	1,510.53		19-Sep-2009 21:12	1,447.09		18-Aug-2010 18:27	1,575.83		30-Aug-2011 18:22
	0.562	2012-03-29		990.00			884.00			1,295.15	19-Sep-2009 21:12		782.25	18-Aug-2010 18:27		863.81	30-Aug-2011 18:22

B - Line

Name Plate Chainage	Most Recent Depol Data	Depol Date	ON Potential	OFF Potential	Date/Time	ON Potential	OFF Potential	Date/Time	ON Potential	OFF Potential	Date/Time	ON Potential	OFF Potential	Date/Time	ON Potential	OFF Potential	Date/Time
5005202+110.100-TS			1,080.00		01-Sep-2007 00:00	808.00		01-Oct-2008 00:00	1,476.72		19-Sep-2009 21:31	1,475.10		18-Aug-2010 16:59	1,711.94		30-Aug-2011 15:48
	0.537	2012-02-08		975.00			598.00			1,261.26	19-Sep-2009 21:31		687.80	18-Aug-2010 16:59		733.63	30-Aug-2011 15:48
5005202+110.800-TS			1,167.00		01-Sep-2007 00:00	850.00		01-Oct-2008 00:00	1,540.92		19-Sep-2009 21:51	1,491.10		18-Aug-2010 17:14	1,770.31		30-Aug-2011 16:05
	0.562	2012-02-08		1,056.00			635.00			1,331.36	19-Sep-2009 21:51		714.94	18-Aug-2010 17:14		833.88	30-Aug-2011 16:05
5005202+113.600-TS			1,112.00		01-Sep-2007 00:00	1,148.00		01-Oct-2008 00:00	1,542.04		19-Sep-2009 21:12	1,529.02		18-Aug-2010 18:26	1,607.89		30-Aug-2011 17:38
	0.539	2012-03-29		1,003.00			910.00			1,313.17	19-Sep-2009 21:12		840.70	18-Aug-2010 18:26		840.32	30-Aug-2011 17:38

TransCanada Pipelines

Title: Rectifier and Groundbed Measurements

Date: Tuesday, March 27, 2012

TransCanada
In business to deliver

Operational Region: Western States Region

Area of Influence: North Pipeline

Start Date: 2007-01-01

End Date: 2012-03-27

Enclosure Name	Reading Type	Rectifier Number	Tap Setting	Rectifier Reading (Volt)	Rectifier Type	Groundbed Name	Groundbed Reading (Amps)	Groundbed Type	Circuit Resistance (ohm)	Reading Date	Source	Groundbed Comment	Rectifier Comment
North Pipeline													
50005101+105.7-R													
	Rectifier	105.7	A5	13.0000	Normal	Beck Road	1.5000	Normal	8.67	10-Jan-2007 00:00	Manual	unknown	
	Rectifier	105.7	A5	13.0000	Normal	Beck Road	1.7000	Normal	7.65	05-Feb-2007 00:00	Manual	unknown	
	Rectifier	105.7	A5	12.5000	Normal	Beck Road	1.6000	Normal	7.81	14-Feb-2007 00:00	Manual	unknown	
	Rectifier	105.7	A5	13.0000	Normal	Beck Road	1.6000	Normal	8.13	05-Mar-2007 00:00	Manual	unknown	
	Rectifier	105.7	A5	13.0000	Normal	Beck Road	1.6000	Normal	8.13	11-Apr-2007 00:00	Manual	unknown	
	Rectifier	105.7	A5	13.5000	Normal	Beck Road	1.7000	Normal	7.94	03-May-2007 00:00	Manual	unknown	
	Rectifier	105.7	A5	14.0000	Normal	Beck Road	1.7000	Normal	8.24	08-Jun-2007 00:00	Manual	unknown	
	Rectifier	105.7	A5	14.0000	Normal	Beck Road	1.7000	Normal	8.24	03-Jul-2007 00:00	Manual	unknown	
	Rectifier	105.7	A5	14.0000	Normal	Beck Road	1.5000	Normal	9.33	09-Aug-2007 00:00	Manual	unknown	
	Rectifier	105.7	A5	13.5000	Normal	Beck Road	1.5000	Normal	9.00	04-Sep-2007 00:00	Manual	unknown	
	Rectifier	105.7	A5	13.5000	Normal	Beck Road	1.7000	Normal	7.94	02-Oct-2007 00:00	Manual	unknown	
	Rectifier	105.7	A5	13.5000	Normal	Beck Road	1.8000	Normal	7.50	06-Nov-2007 00:00	Manual	unknown	
	Rectifier	105.7	A5	14.0000	Normal	Beck Road	1.8000	Normal	7.78	07-Dec-2007 00:00	Manual	unknown	
	Rectifier	105.7	A5	13.0000	Normal	Beck Road	1.8000	Normal	7.22	08-Jan-2008 00:00	Manual	unknown	
	Rectifier	105.7	A5	12.5000	Normal	Beck Road	1.6000	Normal	7.81	14-Feb-2008 00:00	Manual	unknown	
	Rectifier	105.7	A5	12.5000	Normal	Beck Road	1.8000	Normal	6.94	05-Mar-2008 00:00	Manual	unknown	
	Rectifier	105.7	A5	13.0000	Normal	Beck Road	1.5000	Normal	8.67	01-Apr-2008 00:00	Manual	unknown	
	Rectifier	105.7	A3	14.0000	Normal	Beck Road	1.7000	Normal	8.24	12-Jun-2008 00:00	Manual	unknown	
	Rectifier	105.7	A3	14.0000	Normal	Beck Road	1.6000	Normal	8.75	02-Jul-2008 00:00	Manual	unknown	
	Rectifier	105.7	A3	13.4000	Normal	Beck Road	1.1000	Normal	12.18	02-Sep-2008 00:00	Manual	unknown	
	Rectifier	105.7	A3	13.0000	Normal	Beck Road	2.0000	Normal	6.50	10-Nov-2008 00:00	Manual	unknown	
	Rectifier	105.7	A3	13.0000	Normal	Beck Road	1.5000	Normal	8.67	12-Jan-2009 00:00	Manual	unknown	
	Rectifier	105.7	A3	13.0000	Normal	Beck Road	1.5000	Normal	8.67	04-Mar-2009 00:00	Manual	UNKNOWN	
	Rectifier	105.7	A3	13.0000	Normal	Beck Road	1.6200	Normal	8.02	05-May-2009 00:00	Manual	unknown	
	Rectifier	105.7	A3	13.4000	Normal	Beck Road	1.6800	Normal	7.98	09-Jul-2009 00:00	Manual	unknown	
	Rectifier	105.7	A3	13.1800	Normal	Beck Road	1.9000	Normal	6.94	10-Sep-2009 00:00	Manual	unknown	
	Rectifier	105.7	A3	13.0000	Normal	Beck Road	1.5000	Normal	8.67	10-Nov-2009 00:00	Manual		
	Rectifier	105.7	A3	13.3000	Normal	Beck Road	1.5000	Normal	8.67	11-Jan-2010 00:00	Manual		
	Rectifier	105.7	A3	13.4000	Normal	Beck Road	1.7000	Normal	7.88	09-Mar-2010 00:00	Manual	By Dean Christman	By Dean Christman
	Rectifier	105.7	A3	13.6000	Normal	Beck Road	1.7000	Normal	8.00	10-May-2010 00:00	Manual	By Tab Anderson	By Tab Anderson
	Rectifier	105.7	A3	13.9100	Normal	Beck Road	1.7700	Normal	7.86	07-Jul-2010 00:00	Manual	by Rich Christman	by Rich Christman

Rectifier	105.7	A3	14.1000	Normal	Beck Road	1.8000	Normal	7.83	14-Sep-2010 00:00	Manual		
Rectifier	105.7	A3	0.0000	Normal	Beck Road	0.0000	Normal	N/A	02-Nov-2010 00:00	Manual	Off for pipe replacement project and Depot work (Williams Pl. &	Off for pipe replacement project and Depot work (Williams Pl. &
Rectifier	105.7	A3	13.8000	Normal	Beck Road	1.7100	Normal	8.07	06-Jan-2011 00:00	Manual		
Rectifier	105.7	A3	13.7400	Normal	Beck Road	1.9800	Normal	6.94	01-Mar-2011 00:00	Manual		
Rectifier	105.7	A3	13.6000	Normal	Beck Road	1.7200	Normal	7.91	05-May-2011 00:00	Manual		
Rectifier	105.7	A3	0.0000	Normal	Beck Road	0.0000	Normal	N/A	08-Jul-2011 00:00	Manual	OFF for Depot Work	OFF for Depot Work
Rectifier	105.7	A4	18.3000	Normal	Beck Road	2.3600	Normal	7.75	06-Sep-2011 00:00	Manual		
Rectifier	105.7	A4	0.0000	Normal	Beck Road	0.0000	Normal	N/A	01-Nov-2011 00:00	Manual	Off for williams pipeline work	Off for williams pipeline work
Rectifier	105.7	A5	23.2000	Normal	Beck Road	2.5500	Normal	9.10	05-Jan-2012 00:00	Manual	By Dean Christman	By Dean Christman
Rectifier	105.7	A5	23.2000	Normal	Beck Road	3.3000	Normal	7.03	01-Mar-2012 00:00	Manual	By Tab Anderson	By Tab Anderson

TransCanada Pipelines

Title: Rectifier and Groundbed Measurements

Date: Tuesday, March 27, 2012

TransCanada
In business to deliver

Operational Region: Western States Region
Area of Influence: North Pipeline
Start Date: 2007-01-01
End Date: 2012-03-27

Enclosure Name	Reading Type	Rectifier Number	Tap Setting	Rectifier Reading (Volt)	Rectifier Type	Groundbed Name	Groundbed Reading (Amps)	Groundbed Type	Circuit Resistance (ohm)	Reading Date	Source	Groundbed Comment	Rectifier Comment
North Pipeline													
5005301+127.6-R													
	Rectifier	127.6	A4	67.0000	Normal	Baker Road/Spangle	7.5000	Normal	8.93	03-Jan-2007 00:00	Manual	unknown	
	Rectifier	127.6	A4	68.0000	Normal	Baker Road/Spangle	7.5000	Normal	9.07	05-Feb-2007 00:00	Manual	unknown	
	Rectifier	127.6	A4	66.0000	Normal	Baker Road/Spangle	5.5000	Normal	11.82	11-Feb-2007 00:00	Manual	unknown	
	Rectifier	127.6	A4	68.0000	Normal	Baker Road/Spangle	8.0000	Normal	8.50	01-Mar-2007 00:00	Manual	unknown	
	Rectifier	127.6	A4	67.0000	Normal	Baker Road/Spangle	7.8000	Normal	8.59	02-Apr-2007 00:00	Manual	unknown	
	Rectifier	127.6	A4	67.0000	Normal	Baker Road/Spangle	7.2000	Normal	9.31	01-May-2007 00:00	Manual	unknown	
	Rectifier	127.6	A4	70.0000	Normal	Baker Road/Spangle	6.7000	Normal	10.45	04-Jun-2007 00:00	Manual	unknown	
	Rectifier	127.6	A4	62.5000	Normal	Baker Road/Spangle	7.0000	Normal	8.93	02-Jul-2007 00:00	Manual	unknown	
	Rectifier	127.6	A4	66.0000	Normal	Baker Road/Spangle	7.0000	Normal	9.43	02-Aug-2007 00:00	Manual	unknown	
	Rectifier	127.6	A4	64.0000	Normal	Baker Road/Spangle	5.2500	Normal	12.19	04-Sep-2007 00:00	Manual	unknown	
	Rectifier	127.6	A4	65.0000	Normal	Baker Road/Spangle	6.0000	Normal	10.83	01-Oct-2007 00:00	Manual	unknown	
	Rectifier	127.6	A4	64.0000	Normal	Baker Road/Spangle	5.5000	Normal	11.64	01-Nov-2007 00:00	Manual	unknown	
	Rectifier	127.6	A4	66.0000	Normal	Baker Road/Spangle	6.0000	Normal	11.00	04-Dec-2007 00:00	Manual	unknown	
	Rectifier	127.6	A4	65.0000	Normal	Baker Road/Spangle	5.5000	Normal	11.82	02-Jan-2008 00:00	Manual	unknown	
	Rectifier	127.6	A4	65.0000	Normal	Baker Road/Spangle	5.5000	Normal	11.82	11-Feb-2008 00:00	Manual	unknown	
	Rectifier	127.6	A4	66.0000	Normal	Baker Road/Spangle	7.0000	Normal	9.43	04-Mar-2008 00:00	Manual	unknown	
	Rectifier	127.6	C4	66.8000	Normal	Baker Road/Spangle	5.4000	Normal	12.37	07-Apr-2008 00:00	Manual		
	Rectifier	127.6	C4	66.1000	Normal	Baker Road/Spangle	5.0500	Normal	13.09	04-Jun-2008 00:00	Manual	UNKNOWN	
	Rectifier	127.6	C4	66.5000	Normal	Baker Road/Spangle	5.4000	Normal	12.31	03-Jul-2008 00:00	Manual		
	Rectifier	127.6	C4	66.7000	Normal	Baker Road/Spangle	4.9000	Normal	13.61	17-Sep-2008 00:00	Manual	UNKNOWN	
	Rectifier	127.6	C4	66.0000	Normal	Baker Road/Spangle	5.5000	Normal	12.00	03-Nov-2008 00:00	Manual	UNKNOWN	
	Rectifier	127.6	C4	66.0000	Normal	Baker Road/Spangle	5.5000	Normal	12.00	12-Jan-2009 00:00	Manual	UNKNOWN	
	Rectifier	127.6	C4	65.3000	Normal	Baker Road/Spangle	4.9800	Normal	13.11	05-Mar-2009 00:00	Manual	UNKNOWN	
	Rectifier	127.6	C4	64.4000	Normal	Baker Road/Spangle	5.4000	Normal	11.93	04-May-2009 00:00	Manual	UNKNOWN	
	Rectifier	127.6	C4	66.1000	Normal	Baker Road/Spangle	4.8000	Normal	13.77	01-Jul-2009 00:00	Manual	UNKNOWN	
	Rectifier	127.6	C4	0.0000	Normal	Baker Road/Spangle	0.0000	Normal	N/A	01-Sep-2009 00:00	Manual	Out of service for depolarization survey by Rich Christman per	
	Rectifier	127.6	C4	68.1000	Normal	Baker Road/Spangle	4.9800	Normal	13.27	04-Nov-2009 00:00	Manual		
	Rectifier	127.6	C4	0.0000	Normal	Baker Road/Spangle	0.0000	Normal	N/A	05-Jan-2010 00:00	Manual	Rectifier found out of service. Repairs in Progress.	Rectifier found out of service. Repairs in Progress.
	Rectifier	127.6	C4	65.5000	Normal	Baker Road/Spangle	4.8000	Normal	13.65	02-Mar-2010 00:00	Manual	Taken By Pat Brown	Taken By Pat Brown
	Rectifier	127.6	C4	65.6000	Normal	Baker Road/Spangle	4.8000	Normal	13.67	03-May-2010 00:00	Manual	By Scott Apitz	By Scott Apitz
	Rectifier	127.6	C4	65.7800	Normal	Baker Road/Spangle	5.1000	Normal	12.90	05-Jul-2010 00:00	Manual	by James Olson	by James Olson

Rectifier	127.6	C4	65.0400	Normal	Baker Road/Spangle	4.4000	Normal	14.78	02-Sep-2010 00:00	Manual		
Rectifier	127.6	C4	0.0000	Normal	Baker Road/Spangle	0.0000	Normal	N/A	02-Nov-2010 00:00	Manual	Off for Depol work (Williams PL)	Off for Depol work (Williams PL)
Rectifier	127.6	C4	65.5700	Normal	Baker Road/Spangle	3.8100	Normal	17.21	04-Jan-2011 00:00	Manual		
Rectifier	127.6	C4	64.7600	Normal	Baker Road/Spangle	4.3100	Normal	15.03	06-Mar-2011 00:00	Manual		
Rectifier	127.6	C4	64.0200	Normal	Baker Road/Spangle	4.6300	Normal	13.83	03-May-2011 00:00	Manual		
Rectifier	127.6	C4	0.0000	Normal	Baker Road/Spangle	0.0000	Normal	N/A	07-Jul-2011 00:00	Manual	Off for Depol work	Off for Depol work
Rectifier	127.6	C5	69.7000	Normal	Baker Road/Spangle	5.0500	Normal	13.80	02-Sep-2011 00:00	Manual		
Rectifier	127.6	C5	0.0000	Normal	Baker Road/Spangle	0.0000	Normal	N/A	01-Nov-2011 00:00	Manual	Off For Williams Depol.	Off For Williams Depol.
Rectifier	127.6	D2	78.0500	Normal	Baker Road/Spangle	6.2900	Normal	12.41	04-Jan-2012 00:00	Manual	By Bif Hendrix	By Bif Hendrix
Rectifier	127.6	D2	80.2000	Normal	Baker Road/Spangle	5.6100	Normal	14.30	07-Mar-2012 00:00	Manual	By James Olson	By James Olson