

Client Name:	Enbridge Inc.
Contract:	451191_M30 (2018 LI 450455_30J)
Launch/Receive:	OWSV_10 Owingsville CS to Wheelersburg CS
Diameter:	30 in
Length:	62.1 miles
Strain Report Date:	7/19/2019
Reporting Threshold:	0.125 % Bending strain reporting threshold
	0.04 % Strain change reporting threshold

## Pipeline & ILI Information

Client Name	Enbridge Inc.	
Contract	451191_M30 (2018 ILI 450455_30J)	
Launch/Receive	OWSV_10 Owingsville CS to Wheelersburg CS	
Current ILI Run Date	17-Apr-18	
Current ILI Report Date	14-Jun-18	
Current ILI Tool	MFL+CLP+IMU	
Previous ILI Run Date	05-Jun-07	
Previous ILI Report Date	07-Sep-07	
Previous ILI Tool	MFL+CLP+IMU	
Diameter	30.00	inch
Length	62.1	miles
Product	Natural Gas	
Strain Report Date	19-Jul-19	
Report Issue Number	1	
Reporting Thresholds		
Bending Strain Magnitude	0.125	%
Bending strain Change	0.040	%
Authors	Lautaro Ganim	
Checked by	Holly Plummer	
Project Manager	Todd Trammell	

## Bending Strain and Strain Change Assessment Report

### Strain Reporting Threshold

Bending strain features greater or equal to the bending strain reporting threshold and length greater than 40ft (nominal pipe spool length)

The strain values summarized below represent axial bending strain only and do not include any additional axial strain due to other loading mechanisms

Strain Feature or Strain Change ID	16	17	18
Abs Dist (ft)	40180.8	41042.9	44445.4
Velocity (ft/s)	8.7	9.1	8.8
Strain Magnitude (%)	0.132	0.926	0.184
Peak Strain Distance (ft)	40173.6	41021.3	44655.5
Strain Orientation	11:46	7:47	6:28
Horizontal Strain At Peak Strain (%)	-0.016	-0.745	-0.045
Vertical Strain At Peak Strain (%)	0.131	-0.551	-0.178
Max Horizontal Strain (%)	0.033	-0.750	0.075
Max Vertical Strain (%)	0.131	-0.558	-0.178
Strain Direction	Vertical	Horizontal / Vertical	Vertical
Strain Change Abs Dist (ft)		41022.1	44336.3
Strain Change Magnitude (%)		0.593	0.211
Strain Change Orientation (hh mm)		7:50	6:00
Strain Change Horizontal (%)		0.525	-0.050
Strain Change Vertical (%)		-0.338	-0.211
U/S Weld	11060	11250	12210
D/S Weld	11080	11390	12370
Altitude (ft)	647.6	802.9	732.5
Start Abs Dist (ft)	40146.6	40817.0	44208.0
Start U/S Weld	11060	11250	12210
Start Rel Dist (ft)	6.3	3.5	0.6
End Abs Dist (ft)	40215.0	41268.7	44682.7
End U/S Weld	11070	11380	12360
End Rel Dist (ft)	34.7	14.5	4.2
Girth Weld	11070	11310	12340
GW Strain Horizontal (%)	-0.008	-0.424	-0.053
GW Strain Vertical (%)	0.107	-0.103	0.116
GW Strain Magnitude (%)	0.107	0.436	0.128
Diameter (inch)	30.00	30.00	30.00
Wall Thickness (inch)	0.375	0.375	0.375
Grade	X52	X52	X52
MAOP (psi)	936	936	936
Comment			Associated with repair shells
Peak Movement (ft)		4.219	2.491

## ASSUMPTIONS

- 1 In the strain and strain change analysis, described in the report, the pipeline curvature is calculated along the whole pipeline route. Initial pipe shape is assumed to be straight at manufacture for both sets of the IMU data. Strain change values are calculated as the difference in the out-of-straightness curvatures measured by two consecutive inspections.
- 2 Strain and strain change values, provided in the report, represent bending loading only and do not include potential additional axial strains due to any other loading mechanisms (thermal elongation/contraction and Poisson's effects in pipeline restrained by anchors or soil interaction; axial forces due to free spanning or buoyancy).
- 3 True tensile axial strain cannot be determined by means of an IMU inspection. Structural responses such as lateral buckling or upheaval buckling cannot be predicted by the IMU data analysis.
- 4 The strain and strain change analysis is based on the supplied input data and ILI findings; consequently, it is subject to the detection and reporting limits of the IMU and LI tools used (Appendix A) and any derogation from that specification, including but not limited to missing or degraded data due to pipeline cleanliness or operating conditions not meeting the IMU tool operating specification. The strain analysis does not account for any inaccuracies, incompleteness or misclassifications in the supplied input data, ILI data or the referenced IMU data.
- 5 Only features reported by the ILI have been aligned with the strain events. No other data from any previous inspections or surveys by any methods are part of the analysis, i.e. additional coincident features present in the pipeline are not part of the scope for this study.
- 6 Accordingly, it cannot be assumed that all defects present on the pipeline are identified in this assessment, e.g., pin-hole corrosion, narrow axial corrosion, narrow axial or circumferential grooves may be outside the detection and reporting limits of the ILI tool and consequently such undetectable features cannot be aligned with strain events as part of this analysis.
- 7 Due to constant improvements in calculating strain, the values of strain, presented in the report, may vary slightly from the previous report.
- 8 Strain values, provided in this report, reflect the bending strain at time of the inspections and does not account for variations in the external loading, pipeline position or other factors that might have happened before or after the inspection.

All work undertaken in this study has been conducted in accordance with the BHGE Quality Management System and associated documentation as certified by ISO9001: 2015 (certificate number 10038575).

Client Name Enbridge Inc.  
 Contract 451191\_M30 (2018 ILI 450455\_30J)  
 Launch/Receive OWSV\_10 Owingsville CS to Wheelersburg CS  
 Diameter 30 in  
 Length 62.1 miles  
 Issue Number 1

### Strain Feature Detailed Information

Feature No	17	Wall Thickness (inch)	0.375
Feature Type	Deformation Change	Steel Grade	X52
Direction	Horizontal / Vertical	Vehicle Speed (ft/s)	9.1
Upstream Weld	11250	Maximum Overall Strain Magnitude (%)	0.926
Downstream Weld	11390	Length (ft)	451.8
		Maximum Overall Horizontal Strain (%)	-0.750
		Maximum Overall Vertical Strain (%)	-0.558
		Maximum Strain Change Magnitude (%)	0.593
		Maximum Strain Change Horizontal (%)	0.525
		Maximum Strain Change Vertical (%)	-0.338
Start-Point Co-ordinates	Latitude: [REDACTED] degrees Longitude: [REDACTED] degrees	Altitude: 745.5ft	
Mid-Point Co-ordinates	Latitude: [REDACTED] degrees Longitude: [REDACTED] degrees	Altitude: 802.9ft	
End-Point Co-ordinates	Latitude: [REDACTED] degrees Longitude: [REDACTED] degrees	Altitude: 863.7ft	

Girth Weld	Horizontal Strain (%)	Vertical Strain (%)	Strain Magnitude (%)
11260	-0.009	-0.033	0.034
*11270	-0.029	0.101	0.106
*11280	-0.129	0.163	0.208
11290	0.009	0.017	0.019
11300	0.011	0.070	0.071
11310	-0.424	-0.103	0.436
11320	0.238	0.050	0.243
11330	0.156	0.317	0.353
11340	0.022	0.110	0.112
11350	0.001	-0.116	0.116
*11360	-0.172	-0.057	0.181
11370	-0.028	0.104	0.108
11380	-0.035	0.003	0.035

\* The strain value can be affected by tool ride over the girth weld or an adjacent construction bend / fitting. Where this is the case the girth weld strain is not considered in the selection of the maximum girth weld strain detailed below.

Feature	Chainage (ft)	Weld Number	Horizontal Strain (%)	Vertical Strain (%)	Strain Magnitude (%)
Maximum Overall Strain Magnitude	41021.3	11310	-0.745	-0.551	0.926
Maximum Girth Weld Strain	41011.8	11310	-0.424	-0.103	0.436

All the coincident features identified in the vicinity of the strain event are described in the table below

Girth Weld No	Rel Dist (ft)	Comment	Peak Depth (%WT)	Orientation (hrs.mins)
11240	32.5	Girth Weld Misalignment		
11260	0.0	NWT 0.3750/0 3850IN		
11260	0.6	Under bend		
11280	0.0	NWT 0.3850/0 3750IN		
11290	4.7	Ext Metal Loss	10	11:49
11290	5.3	Ext Metal Loss	16	11:56
11290	6.1	Ext Metal Loss	14	11:26
11290	14.1	Ext Metal Loss	12	5:41
11290	14.5	Ext Metal Loss	14	5:24
11290	14.8	Ext Metal Loss	14	5:31
11290	15.0	Ext Metal Loss	10	5:24
11290	16.7	Ext Metal Loss	19	7:04
11290	20.9	Ext Metal Loss	13	5:24
11290	21.0	Ext Metal Loss	11	5:58
11290	21.0	Ext Metal Loss	13	5:18
11290	22.0	Ext Metal Loss	10	5:56
11290	23.1	Ext Metal Loss	11	6:32
11290	26.6	Ext Metal Loss	10	5:48
11290	33.7	Ext Metal Loss	10	11:39
11290	34.0	Ext Metal Loss	13	11:54
11300	3.4	Ext Metal Loss	17	7:08
11300	9.0	Over bend		
11300	22.4	Ext Metal Loss	17	7:15
11310	20.6	Over bend		
11310	25.5	Ext Metal Loss	15	5:39
11310	26.5	Ext Metal Loss	11	12:37
11310	34.5	Ext Metal Loss	18	5:48
11320	3.2	Ext Metal Loss	10	8:11
11320	17.0	Under bend		
11320	20.0	Ext Metal Loss	16	5:57
11320	22.1	Ext Metal Loss	11	8:03
11320	24.5	Ext Metal Loss	11	8:17
11320	25.3	Ext Metal Loss	10	6:10
11320	26.0	Ext Metal Loss	10	6:33
11320	26.4	Ext Metal Loss	13	6:11

11320	27.3	Ext Metal Loss	10	6:18
11320	28.0	Ext Metal Loss	10	5:28
11320	28.8	Ext Metal Loss	14	5:55
11320	29.2	Ext Metal Loss	10	5:17
11320	29.8	Ext Metal Loss	13	5:55
11320	30.5	Ext Metal Loss	10	4:39
11320	30.6	Ext Metal Loss	14	6:22
11320	32.0	Dent Assoc. Seam Weld		12:00
11320	32.5	Ext Metal Loss	10	5:15
11320	33.1	Ext Metal Loss	12	5:49
11340	22.4	Under bend		
11350	35.5	Girth Weld Misalignment		
11360	1.4	Under bend		
11370	4.5	Under bend		
11380	1.6	Ext Metal Loss	11	9:04
11380	3.0	Close Metal Object		6:45
11380	3.4	Close Metal Object		6:30
11380	3.7	Close Metal Object		6:45
11380	4.1	Close Metal Object		6:45
11380	4.4	Close Metal Object		7:00
11380	8.5	Over bend		

Client Name:	Enbridge Inc.
Contract:	451191_V30
Launch/Receive:	OWSV 10 - Wheelersburg CS to Owingsville CS
Diameter:	30 in
Length:	62.2 miles
Strain Report Date:	9/23/2019
Reporting Threshold:	0.125 % Bending strain reporting threshold 0.04 % Strain change reporting threshold

## Pipeline & ILI Information

Client Name:	Enbridge Inc.
Contract:	451191_V30
Launch/Receive:	OWSV 10 - Wheelersburg CS to Owingsville CS

Current ILI Run Date:	7-Jun-19
Current ILI Report Date:	24-Jul-19
Current ILI Tool:	CLP + IMU

Previous ILI Run Date:	5-Jun-07
Previous ILI Report Date:	7-Sep-07
Previous ILI Tool:	MFL + IMU

Diameter:	30.00	inch
Length:	62.2	miles
Product:	Natural Gas	

Strain Report Date:	23-Sep-19
Report Issue Number:	1

<b>Reporting Thresholds:</b>		
Bending Strain Magnitude	0.125	%
Bending strain Change	0.040	%

Authors:	Rafael Tunon
Checked by:	Vacun Virk
Project Manager:	Todd Trammell

## Bending Strain and Strain Change Assessment Report

**Strain Reporting Threshold:**

Bending strain features greater or equal to the bending strain reporting threshold and length greater than 40ft (nominal pipe spool length)

The strain values summarized below represent axial bending strain only and do not include any additional axial strain due to other loading mechanisms

Strain Feature or Strain Change ID	16	17	18
Abs Dist (ft)	40155.3	40964.9	44424.5
Velocity (ft/s)	8.4	9.0	8.6
Strain Magnitude (%)	0.129	1.050	0.185
Peak Strain Distance (ft)	40140.9	40999.2	44635.0
Strain Orientation	11:59	7:51	6:37
Horizontal Strain At Peak Strain (%)	0.000	-0.865	-0.060
Vertical Strain At Peak Strain (%)	0.129	-0.595	-0.175
Max Horizontal Strain (%)	0.052	-0.868	0.073
Max Vertical Strain (%)	0.129	-0.617	-0.175
Strain Direction	Vertical	Horizontal / Vertical	Vertical
Strain Change Abs Dist (ft)		40999.2	44260.3
Strain Change Magnitude (%)		0.724	0.226
Strain Change Orientation (hh:mm)		7:55	12:03
Strain Change Horizontal (%)		-0.617	-0.070
Strain Change Vertical (%)		-0.400	0.226
U/S Weld	11070	11230	12220
D/S Weld	11090	11400	12380
Altitude (ft)	761.7	903.0	841.7
Start Abs Dist (ft)	40127.1	40687.7	44184.6
Start U/S Weld	11070	11230	12220
Start Rel Dist (ft)	8.7	0.3	0.5
End Abs Dist (ft)	40183.4	41242.1	44664.5
End U/S Weld	11080	11390	12370
End Rel Dist (ft)	25.0	9.7	9.2
Girth Weld	11080	11320	12260
GW Strain Horizontal (%)	-0.031	-0.404	0.026
GW Strain Vertical (%)	0.115	-0.091	0.163
GW Strain Magnitude (%)	0.119	0.414	0.165
Diameter (inch)	30.00	30.00	30.00
Wall Thickness (inch)	0.404	0.404	0.404
Grade	X65	X65	X65
MAOP (psi)	1050	1050	1050
Comment	ID16 in 2018v2009 strain comparison report	ID17 in 2018v2007 strain comparison report	ID18 in 2018v2007 strain comparison report / Associated with repair shells
Peak Movement (ft)		5.187	2.104

## Weld Strain Listing

### Weld Strain List:

GW ID	Abs Dist (ft)	Strain Magnitude	Horizontal Strain	Vertical Strain	Altitude (ft)
11260	40791.4	0.121	-0.032	-0.117	857.415
11270	40830.8	0.043	-0.015	-0.040	861.263
11280	40869.6	0.113	-0.021	0.111	868.874
11290	40896.2	0.239	-0.117	0.209	877.903
11300	40910.7	0.043	0.043	-0.002	883.163
11310	40949.5	0.057	0.019	0.054	897.335
11320	40989.7	0.414	-0.404	-0.091	910.315
11330	41030.0	0.208	0.206	0.032	917.095
11340	41070.2	0.375	0.186	0.326	923.253
11350	41085.2	0.108	0.034	0.102	926.865
11360	41125.3	0.135	-0.009	-0.135	936.718
11370	41164.4	0.185	-0.175	-0.058	946.821
11380	41193.3	0.109	-0.061	0.091	955.472
11390	41232.4	0.044	-0.042	-0.014	970.331
11400	41272.4	0.036	-0.012	0.034	986.742



## ASSUMPTIONS

- 1 In the strain and strain change analysis, described in the report, the pipeline curvature is calculated along the whole pipeline route. Initial pipe shape is assumed to be straight at manufacture for both sets of the IMU data. Strain change values are calculated as the difference in the out-of-straightness curvatures measured by two consecutive inspections.
- 2 Strain and strain change values, provided in the report, represent bending loading only and do not include potential additional axial strains due to any other loading mechanisms (thermal elongation/contraction and Poisson's effects in pipeline restrained by anchors or soil interaction; axial forces due to free spanning or buoyancy).
- 3 True tensile axial strain cannot be determined by means of an IMU inspection. Structural responses such as lateral buckling or upheaval buckling cannot be predicted by the IMU data analysis.
- 4 The strain and strain change analysis is based on the supplied input data and ILI findings; consequently, it is subject to the detection and reporting limits of the IMU and ILI tools used (Appendix A) and any derogation from that specification, including but not limited to missing or degraded data due to pipeline cleanliness or operating conditions not meeting the IMU tool operating specification. The strain analysis does not account for any inaccuracies, incompleteness or misclassifications in the supplied input data, ILI data or the referenced IMU data.
- 5 Only features reported by the ILI have been aligned with the strain events. No other data from any previous inspections or surveys by any methods are part of the analysis, i.e. additional coincident features present in the pipeline are not part of the scope for this study.
- 6 Accordingly, it cannot be assumed that all defects present on the pipeline are identified in this assessment, e.g., pin-hole corrosion, narrow axial corrosion, narrow axial or circumferential grooves may be outside the detection and reporting limits of the ILI tool and consequently such undetectable features cannot be aligned with strain events as part of this analysis.
- 7 Due to constant improvements in calculating strain, the values of strain, presented in the report, may vary slightly from the previous report.
- 8 Strain values, provided in this report, reflect the bending strain at time of the inspections and does not account for variations in the external loading, pipeline position or other factors that might have happened before or after the inspection.

All work undertaken in this study has been conducted in accordance with the BHGE Quality Management System and associated documentation as certified by ISO9001: 2015 (certificate number 10038575).

<b>Client Name</b>	Enbridge Inc.	
<b>Contract</b>	451191_V30	
<b>Launch/Receive</b>	OWSV_10 - Owingsville CS to Wheelersburg CS	
<b>Diameter</b>	30	in
<b>Length</b>	62.2	miles
<b>Strain Report Date</b>	10/21/2021	
<b>Reporting Threshold</b>	0.125	% Bending strain reporting threshold
	0.04	% Strain change reporting threshold

## Pipeline & ILI Information

<b>Client Name</b>	Enbridge Inc.	
<b>Contract</b>	451191_V30	
<b>Launch/Receive</b>	OWSV_10 - Owingsville CS to Wheelersburg CS	
<b>Current ILI Run Date</b>	7-Jun-19	
<b>Current ILI Report Date</b>	7-Sep-19	
<b>Current ILI Tool</b>	CLP+ MU	
<b>Previous ILI Run Date</b>	5-Jun-07	
<b>Previous ILI Report Date</b>	7-Sep-07	
<b>Previous ILI Tool</b>	MFL+ MU	
<b>Diameter</b>	30.00	inch
<b>Length</b>	62.2	miles
<b>Product</b>	Natural Gas	
<b>Strain Report Date</b>	21-Oct-21	
<b>Report Issue Number</b>	2 - Weld numbering has been updated	
<b>Reporting Thresholds</b>		
<b>Bending Strain Magnitude</b>	0.125	%
<b>Bending strain Change</b>	0.040	%
<b>Authors</b>	Varun Virk	
<b>Checked by</b>	Lautaro Ganim	
<b>Project Manager</b>	Todd Trammell	

## Bending Strain and Strain Change Assessment Report

**Strain Reporting Threshold**

Bending strain features greater or equal to the bending strain reporting threshold and length greater than 12 m (nominal pipe spool length).  
 Bending strain features greater or equal to the bending strain reporting threshold and length greater than 40ft (nominal pipe spool length)  
 The strain values summarized below represent axial bending strain only and do not include any additional axial strain due to other loading mechanisms

Strain Feature or Strain Change ID	16	17	18
Abs Dist (ft)	40155.3	40964.9	44424.5
Velocity (ft/s)	8.4	9.0	8.6
Strain Magnitude (%)	0.129	1.050	0.185
Peak Strain Distance (ft)	40141.6	40999.2	44635.0
Strain Orientation	11:57	07:51	06:37
Horizontal Strain At Peak Strain (%)	-0.003	-0.867	-0.060
Vertical Strain At Peak Strain (%)	0.128	-0.590	-0.175
Max Horizontal Strain (%)	0.052	-0.867	0.073
Max Vertical Strain (%)	0.128	-0.615	-0.175
Strain Direction	Vertical	Horizontal / Vertical	Vertical
Strain Change Abs Dist (ft)		40999.2	44260.3
Strain Change Magnitude (%)		0.712	0.232
Strain Change Orientation (hh mm)		7 55	12:05
Strain Change Horizontal (%)		-0.604	0.063
Strain Change Vertical (%)		-0.396	0.232
U/S Weld	11060	11220	12210
D/S Weld	11080	11390	12370
Mid Point Altitude (ft)	761.7	903.3	841.6
Start Abs Dist (ft)	40127.1	40687.7	44184.6
Start U/S Weld	11060	11220	12210
Start Rel Dist (ft)	8.7	0.3	0.5
End Abs Dist (ft)	40183.4	41242.1	44664.5
End U/S Weld	11070	11380	12360
End Rel Dist (ft)	25.0	9.7	9.2
Girth Weld	11070	11310	12230
GW Strain Horizontal (%)	-0.031	-0.397	-0.064
GW Strain Vertical (%)	0.114	-0.086	-0.206
GW Strain Magnitude (%)	0.119	0.406	0.216
Diameter (inch)	30.00	30.00	30.00
Wall Thickness (inch)	0.375	0.375	0.485
Grade	X52	X52	X65
MAOP (psi)	936	936	936
Comment	D16 in 2018v2009 strain comparison report	D17 in 2018v2007 strain comparison report	D18 in 2018v2007 strain comparison report / Associated with repair shells
Peak Movement (ft)		5.2	2.1

Change from 2007

## ASSUMPTIONS

- 1 In the strain and strain change analysis, described in the report, the pipeline curvature is calculated along the whole pipeline route. Initial pipe shape is assumed to be straight at manufacture for both sets of the IMU data. Strain change values are calculated as the difference in the out-of-straightness curvatures measured by two consecutive inspections.
- 2 Strain and strain change values, provided in the report, represent bending loading only and do not include potential additional axial strains due to any other loading mechanisms (thermal elongation/contraction and Poisson's effects in pipeline restrained by anchors or soil interaction; axial forces due to free spanning or buoyancy).
- 3 True tensile axial strain cannot be determined by means of an MU inspection. Structural responses such as lateral buckling or upheaval buckling cannot be predicted by the IMU data analysis.
- 4 The strain and strain change analysis is based on the supplied input data and LI findings; consequently, it is subject to the detection and reporting limits of the IMU and LI tools used (Appendix A) and any derogation from that specification, including but not limited to missing or degraded data due to pipeline cleanliness or operating conditions not meeting the IMU tool operating specification. The strain analysis does not account for any inaccuracies, incompleteness or misclassifications in the supplied input data, LI data or the referenced MU data.
- 5 Only features reported by the LI have been aligned with the strain events. No other data from any previous inspections or surveys by any methods are part of the analysis, i.e. additional coincident features present in the pipeline are not part of the scope for this study.
- 6 Accordingly, it cannot be assumed that all defects present on the pipeline are identified in this assessment, e.g., pin-hole corrosion, narrow axial corrosion, narrow axial or circumferential grooves may be outside the detection and reporting limits of the LI tool and consequently such undetectable features cannot be aligned with strain events as part of this analysis.
- 7 Due to constant improvements in calculating strain, the values of strain, presented in the report, may vary slightly from the previous report.
- 8 Strain values, provided in this report, reflect the bending strain at time of the inspections and does not account for variations in the external loading, pipeline position or other factors that might have happened before or after the inspection.

All work undertaken in this study has been conducted in accordance with the Baker Hughes Quality Management System and associated documentation as certified by ISO9001: 2015 (certificate number 10038575).

Client Name Enbridge Inc.  
 Contract 451191\_V30  
 Launch/Receive OWSV\_10 - Owingsville CS to Wheelersburg CS  
 Diameter 30 in  
 Length 62.2 miles  
 Issue Number 2

### Strain Feature Detailed Information

Feature No	17	Wall Thickness (inch)	0.375
Feature Type	Deformation Change	Steel Grade	X52
Direction	Horizontal / Vertical	Vehicle Speed (ft/s)	9.0
Upstream Weld	11220	Maximum Overall Strain Magnitude (%)	1.049
Downstream Weld	11390	Length (ft)	554.4
		Maximum Overall Horizontal Strain (%)	-0.867
		Maximum Overall Vertical Strain (%)	-0.615
		Maximum Strain Change Magnitude (%)	0.712
		Maximum Strain Change Horizontal (%)	-0.604
		Maximum Strain Change Vertical (%)	-0.396

	Altitude (ft)
Feature Start	841.991
Feature Mid Point	903.281
Point of Peak Strain	912.707
Feature End	974.790

Girth Weld	Horizontal Strain (%)	Vertical Strain (%)	Strain Magnitude (%)
11230	-0.041	0.019	0.045
11240	0.006	-0.026	0.027
11250	-0.032	-0.117	0.122
11260	-0.012	-0.041	0.043
*11270	-0.020	0.114	0.116
*11280	-0.115	0.209	0.238
11290	0.043	0.002	0.043
11300	0.017	0.052	0.055
11310	-0.397	-0.086	0.406
11320	0.206	0.032	0.208
11330	0.193	0.331	0.383
*11340	0.037	0.108	0.114
11350	-0.010	-0.137	0.137
11360	-0.173	-0.057	0.182
11370	-0.061	0.090	0.109
11380	-0.042	-0.013	0.044

\* The strain value can be affected by tool ride over the girth weld or an adjacent construction bend / fitting. Where this is the case the girth weld strain is not considered in the selection of the maximum girth weld strain detailed below.

Feature	Distance (ft)	Weld Number	Horizontal Strain (%)	Vertical Strain (%)	Strain Magnitude (%)
Maximum Overall Strain Magnitude	40999.2	11310	-0.867	-0.590	1.049
Maximum Girth Weld Strain	40989.7	11310	-0.397	-0.086	0.406

All the coincident features identified in the vicinity of the strain event are described in the table below

Girth Weld No	Abs Dist (ft)	Rel Dist (ft)	Comment	Peak Depth (%WT)	Orientation (hrs mins)
11240	40764.3	11.9	Over bend		
11250	40830.8	39.4	NWT 0 3750/0 3850IN		
11260	40852.2	21.4	Under bend		
11270	40896.2	26.6	NWT 0 3850/0 3750IN		
11280	40896.2	0.0	Girth Weld Misalignment		
11300	40974.6	25.1	Over bend		
11310	41019.2	29.5	Over bend		
11320	41051.8	21.8	Under bend		
11340	41085.2	0.0	Girth Weld Misalignment		
11340	41114.7	29.5	Under bend		
11360	41177.7	13.3	Under bend		
11370	41212.1	18.8	Under bend		