



Memorandum

U.S. Department
of Transportation
Pipeline and
Hazardous Materials
Safety Administration

Central Region Office

Office of Pipeline Safety

Date: September 30, 2010

Subject: Summary Incident Report
Enbridge Energy Partners, L.P. (Op ID 11169)
Clearbrook, MN to Deer River, MN (Unit 3083)
Line 3 Crude Oil Leak
November 13, 2007
SMART Activity ID 124316

From: James Bunn, Staff Engineer

To: David Barrett, Director – Central Region, PHP-300

1.0 SUMMARY

At approximately 7:00 a.m. on November 13, 2007, crude oil leaked from the Enbridge Energy Partners L.P. (“Enbridge”) Line 3 Pipeline in Clearwater County, Clearbrook, MN (the “Incident”). An estimated 2 barrels (bbls) of crude oil was released from the pipeline. The Incident occurred on the pipeline right of way (ROW) near milepost number 912 (MP 912), approximately three miles southeast of the Enbridge Clearbrook Terminal. No fatalities or injuries occurred as a result of the Incident. The Incident did not occur in a high consequence area (HCA) and no water was impacted. The total cost of the Incident, pipeline repair and environmental cleanup, is estimated at \$30,680. There were no service interruptions or supply impacts as a result of the Incident.

2.0 PIPELINE SYSTEM

Enbridge’s Line 3 is a 34-inch diameter crude oil pipeline that runs from Gretna, Manitoba, Canada to Superior, WI. At the Incident location, the pipeline is constructed of API 5L X-52

line pipe manufactured by U.S. Steel in 1967. The pipeline is 34-inch diameter by 0.344-inch wall thickness, (double submerged arc welded) DSAW type pipe, coated with a tape type system. The line pipe was transported from the pipe mill to the construction site on rail cars.

The Line 3 maximum operating pressure (MOP) is 757 psig.

3.0 DISCUSSION

An Enbridge employee in route to work discovered a crude oil leak in a ditch on the south side of County Road 3. At 8:22 a.m. Enbridge Notified the Minnesota Office of Pipeline Safety (MNOPS) Duty Officer that a leak had occurred in a pasture on County Road 3, about 3 ½ miles east of Highway 92. Brian Pierzina, MNOPS Senior inspector, conducted an on-site investigation of the Incident.

In situ visual inspection of the damaged pipe joint revealed two pin-holes located in the DSAW longitudinal seam. Ultrasonic inspection of the longitudinal seam detected a fatigue crack that initiated on the pipe internal surface at the toe of the DSAW longitudinal seam. This type of defect is very similar to other defects that had been identified by Enbridge on Line 3.

In late November 2007, Enbridge ran an in-line inspection (ILI) crack detection (CD) tool from Clearbrook, MN to Superior, WI to determine if the MP 912 fatigue crack could be detected. The ILI tool did not complete the entire assessment from Clearbrook to Superior due to a mechanical failure experienced during the run. However, the MP 912 joint containing the fatigue crack was successfully inspected and the fatigue crack was identified by the ILI tool.

On November 28, 2007, Enbridge removed an eleven foot section of pipe at MP 912 that contained the fatigue crack. This section of pipe was transported to a metallurgical laboratory for further analysis. The analysis confirmed that the failure was a fatigue type failure that initiated on the pipe internal surface at the toe of the DSAW longitudinal seam. The fatigue crack was apparently initiated by cyclical loading that occurred during rail transport of the line pipe from the pipe mill to the construction site. Pressure cycling during the operational life of the pipeline caused the fatigue crack to grow to failure.

Based on this incident, Enbridge updated their crack management program for Line 3.

4.0 EMERGENCY RESPONSE

Enbridge employees were dispatched to the Incident site.

5.0 RETURN TO SERVICE

After the field investigation was complete, a four foot long Type B, tight fitting repair sleeve was installed in the area where the Incident occurred.

At the time of the Incident, Line 3 operating pressure was approximately 337 psig. Enbridge imposed a voluntary pressure reduction on Line 3 at the Clearbrook Terminal discharge. The Clearbrook Terminal maximum discharge pressure was limited to 80% of the maximum discharge pressure experienced within 15 days previous to the Incident, specifically 434 psig.

The pipeline was then returned to service at reduced pressure. As of September 30, 2010, the pressure reduction remains in place.

6.0 FINDINGS

The Enbridge Line 3 MP 912 Incident was caused by a fatigue crack that initiated on the pipe internal surface at the toe of the DSAW longitudinal seam. The fatigue crack was apparently initiated by cyclic loading that occurred during rail transport of the line pipe from the pipe mill to the construction site and eventually grew to failure from pressure cycling during pipeline operation.

EXHIBITS

Information regarding the Incident was reported by Enbridge to the National Response Center (NRC) on November 13, 2007 in NRC Report No. 854402 (Exhibit A), and to the Pipeline and Hazardous Materials Safety Administration (PHMSA) in Accident Report No. 20070350 dated December 12, 2007 (Exhibit B).

Exhibit A	NRC Report No. 854402
Exhibit B	Accident Report No. 20070350
Exhibit C	Metallurgical Report

EXHIBIT A
NRC REPORT No. 854402

NATIONAL RESPONSE CENTER 1-800-424-8802

*** For Public Use ***

Information released to a third party shall comply with any applicable federal and/or state Freedom of Information and Privacy Laws

Incident Report # 854402

INCIDENT DESCRIPTION

*Report taken at 09:33 on 13-NOV-07

Incident Type: PIPELINE

Incident Cause: EQUIPMENT FAILURE

Affected Area:

The incident was discovered on 13-NOV-07 at 07:20 local time.

Affected Medium: LAND GROUND

SUSPECTED RESPONSIBLE PARTY

Organization: ENBRIDGE ENERGY CO.
SUPERIOR, WI 54880

Type of Organization: PRIVATE ENTERPRISE

INCIDENT LOCATION

County: CLEARWATER

City: CLEAR BROOK State: MN

Section: 3 Township: 148N Range: 37W NEAR COUNTY 3

RELEASED MATERIAL(S)

CHRIS Code: OIL Official Material Name: OIL: CRUDE

Also Known As:

Qty Released: 2 BARREL(S)

DESCRIPTION OF INCIDENT

CALLER IS REPORTING THAT 2 BARRELS OF CRUDE OIL RELEASED FROM A PIPELINE ONTO THE GROUND DUE TO A LEAKING PIPELINE.

INCIDENT DETAILS

Pipeline Type: TRANSMISSION

DOT Regulated: YES

Pipeline Above/Below Ground: BELOW

Exposed or Under Water: NO

Pipeline Covered: UNKNOWN

DAMAGES

Fire Involved: NO Fire Extinguished: UNKNOWN

INJURIES: NO Hospitalized: Empl/Crew: Passenger:

FATALITIES: NO Empl/Crew: Passenger: Occupant:

EVACUATIONS: NO Who Evacuated: Radius/Area:

Damages: NO

<u>Closure Type</u>	<u>Description of Closure</u>	<u>Length of Closure</u>	<u>Direction of Closure</u>
Air: N			

Road: N			Major Artery: N
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Waterway: N

Track: N

Passengers Transferred: NO

Environmental Impact: UNKNOWN
Media Interest: NONE Community Impact due to Material:

REMEDIAL ACTIONS

PIPELINE MAINTENANCE CREWS WERE DISPATCHED TO THE SITE, PADS WERE PUT DOWN ON THE AREA AND LINES WERE CLOSED
Release Secured: YES
Release Rate:
Estimated Release Duration:

WEATHER

Weather: UNKNOWN, °F

ADDITIONAL AGENCIES NOTIFIED

Federal: NONE
State/Local: LOCAL SHERIFF'S OFFICE
State/Local On Scene:
State Agency Number: NO REPORT #

NOTIFICATIONS BY NRC

ATLANTIC STRIKE TEAM (MAIN OFFICE)
13-NOV-07 09:38
USCG ICC (ICC ONI)
13-NOV-07 09:38
DOT CRISIS MANAGEMENT CENTER (MAIN OFFICE)
13-NOV-07 09:38
U.S. EPA V (MAIN OFFICE)
13-NOV-07 09:40
MN DEPT OF HEALTH (MAIN OFFICE)
13-NOV-07 09:38
MN U.S. ATTORNEY'S OFFICE (ATTN: CARL WAHL)
13-NOV-07 09:38
NATIONAL INFRASTRUCTURE COORD CTR (MAIN OFFICE)
13-NOV-07 09:38
NOAA RPTS FOR MN (MAIN OFFICE)
13-NOV-07 09:38
PIPELINE & HAZMAT SAFETY ADMIN (OFFICE OF PIPELINE SAFETY (AUTO))
13-NOV-07 09:38
MN DEM ATTN: MS. GOELZ (MAIN OFFICE)
13-NOV-07 09:38
SURFACE TRANS SECURITY INSPECT PROG (COMMAND CENTER)
13-NOV-07 09:38

ADDITIONAL INFORMATION

CALLER HAD NO FURTHER INFORMATION.

*** END INCIDENT REPORT # 854402 ***

EXHIBIT B
ACCIDENT REPORT
No. 20070350



U.S. Department of Transportation
Research and Special Programs
Administration

ACCIDENT REPORT – HAZARDOUS LIQUID PIPELINE SYSTEMS

Report Date _____

No. _____
(DOT Use Only)

INSTRUCTIONS

Important: Please read the separate instructions for completing this form before you begin. They clarify the information requested and provide specific examples. If you do not have a copy of the instructions, you can obtain one from the Office Of Pipeline Safety Web Page at <http://ops.dot.gov>.

PART A – GENERAL REPORT INFORMATION

Check one or more boxes as appropriate:

Original Report Supplemental Report Final Report

1. a. Operator's OPS 5-digit Identification Number (if known) _____ / _____ /
2. b. If Operator does not own the pipeline, enter Owner's OPS 5-digit Identification Number (if known) _____ / _____ /
- c. Name of Operator _____
- d. Operator street address _____
- e. Operator address _____
City, County, State and Zip Code _____

IMPORTANT: IF THE SPILL IS SMALL, THAT IS, THE AMOUNT IS AT LEAST 5 GALLONS BUT IS LESS THAN 5 BARRELS, COMPLETE THIS PAGE ONLY, UNLESS THE SPILL IS TO WATER AS DESCRIBED IN 49 CFR §195.52(A)(4) OR IS OTHERWISE REPORTABLE UNDER §195.50 AS REVISED IN CY 2001.

2. Time and date of the accident
 _____ / _____ / _____ / _____
 hr. month day year

3. Location of accident
(If offshore, do not complete a through d. See Part C.1)
 - a. Latitude: _____ Longitude: _____
(if not available, see instructions for how to provide specific location)
 - b. _____
City, and County or Parish
 - c. _____
State and Zip Code
 - d. Mile post/valve station or survey station no.
(whichever gives more accurate location)

4. Telephone report
 _____ / _____ / _____ / _____
 NRC Report Number month day year

5. Losses (Estimated)

Public/Community Losses reimbursed by operator:

Public/private property damage \$ _____
 Cost of emergency response phase \$ _____
 Cost of environmental remediation \$ _____
 Other Costs \$ _____
 (describe) _____

Operator Losses:

Value of product lost \$ _____
 Value of operator property damage \$ _____
 Other Costs \$ _____
 (describe) _____

Total Costs \$ _____

6. Commodity Spilled Yes No
(If Yes, complete Parts a through c where applicable)
 - a. Name of commodity spilled _____
 - b. Classification of commodity spilled:
 HVLs /other flammable or toxic fluid which is a gas at ambient conditions
 CO₂ or other non-flammable, non-toxic fluid which is a gas at ambient conditions
 Gasoline, diesel, fuel oil or other petroleum product which is a liquid at ambient conditions
 Crude oil

c. Estimated amount of commodity involved :

Barrels
Gallons (check only if spill is less than one barrel)

Amounts:

Spilled : _____

Recovered: _____

CAUSES FOR SMALL SPILLS ONLY (5 gallons to under 5 barrels) :

(For large spills [5 barrels or greater] see Part H)

Corrosion	Natural Forces	Excavation Damage	Other Outside Force Damage
Material and/or Weld Failures	Equipment	Incorrect Operation	Other

PART B – PREPARER AND AUTHORIZED SIGNATURE

(type or print) Preparer's Name and Title

Area Code and Telephone Number

Preparer's E-mail Address

Area Code and Facsimile Number

Authorized Signature

(type or print) Name and Title

Date

Area Code and Telephone Number

PART C – ORIGIN OF THE ACCIDENT (Check all that apply)

1. Additional location information
 a. Line segment name or ID _____
 b. Accident on Federal land other than Outer Continental Shelf Yes No
 c. Is pipeline interstate? Yes No

Offshore: Yes No (complete d if offshore)
 d. Area _____ Block # _____
 State /_____/ or Outer Continental Shelf

2. Location of system involved (check all that apply)
 Operator's Property
 Pipeline Right of Way
 High Consequence Area (HCA)?
 Describe HCA _____

3. Part of system involved in accident
 Above Ground Storage Tank
 Cavern or other below ground storage facility
 Pump/meter station; terminal/tank farm piping and equipment, including sumps
 Other Specify: _____

Onshore **pipeline**, including valve sites
 Offshore **pipeline**, including platforms

If failure occurred on **Pipeline**, complete items a - g:

4. Failure occurred on
 Body of Pipe Pipe Seam Scraper Trap
 Pump Sump Joint
 Component Valve Metering Facility
 Repair Sleeve Welded Fitting Bolted Fitting
 Girth Weld
 Other (specify) _____

Year the component that failed was installed: /_____/

5. Maximum operating pressure (MOP)
 a. Estimated pressure at point and time of accident: _____ PSIG
 b. MOP at time of accident: _____ PSIG
 c. Did an overpressurization occur relating to the accident?
 Yes No

a. Type of leak or rupture
 Leak: Pinhole Connection Failure (complete sec. H5)
 Puncture, diameter (inches) _____
 Rupture: Circumferential – Separation
 Longitudinal – Tear/Crack, length (inches) _____
 Propagation Length, total, both sides (feet) _____
 N/A
 Other _____

b. Type of block valve used for isolation of immediate section:
 Upstream: Manual Automatic Remote Control
 Check Valve
 Downstream: Manual Automatic Remote Control
 Check Valve

c. Length of segment isolated _____ ft
 d. Distance between valves _____ ft
 e. Is segment configured for internal inspection tools? Yes No
 f. Had there been an in-line inspection device run at the point of failure? Yes No Don't Know
 Not Possible due to physical constraints in the system
 g. If Yes, type of device run (check all that apply)
 High Resolution Magnetic Flux tool Year run: _____
 Low Resolution Magnetic Flux tool Year run: _____
 UT tool Year run: _____
 Geometry tool Year run: _____
 Caliper tool Year run: _____
 Crack tool Year run: _____
 Hard Spot tool Year run: _____
 Other tool Year run: _____

PART D – MATERIAL SPECIFICATION

1. Nominal pipe size (NPS) _____ / in.
 2. Wall thickness _____ / in.
 3. Specification _____ SMYS _____
 4. Seam type _____
 5. Valve type _____
 6. Manufactured by _____ in year /_____/

PART E – ENVIRONMENT

1. Area of accident In open ditch
 Under pavement Above ground
 Underground Under water
 Inside/under building Other _____

2. Depth of cover: _____ inches

PART F – CONSEQUENCES

1. Consequences (check and complete all that apply)
 a. Fatalities Injuries
 Number of operator employees: _____
 Contractor employees working for operator: _____
 General public: _____
Totals: _____
 b. Was pipeline/segment shutdown due to leak? Yes No
 If Yes, how long? _____ days _____ hours _____ minutes
 c. Product ignited Yes No
 d. Explosion Yes No
 e. Evacuation (general public only) _____ / people
 Reason for Evacuation:
 Precautionary by company
 Evacuation required or initiated by public official
 f. Elapsed time until area was made safe:
 _____ / hr. _____ / min.

2. Environmental Impact
 a. Wildlife Impact: Fish/aquatic Yes No
 Birds Yes No
 Terrestrial Yes No
 b. Soil Contamination Yes No
 If Yes, estimated number of cubic yards: _____
 c. Long term impact assessment performed: Yes No
 d. Anticipated remediation Yes No
 If Yes, check all that apply: Surface water Groundwater Soil Vegetation Wildlife
 e. Water Contamination: Yes No (If Yes, provide the following)
 Amount in water _____ barrels
 Ocean/Seawater No Yes
 Surface No Yes
 Groundwater No Yes
 Drinking water No Yes (If Yes, check below.)
 Private well Public water intake

PART G – LEAK DETECTION INFORMATION

1. Computer based leak detection capability in place? Yes No
2. Was the release initially detected by? (check one):
 CPM/SCADA-based system with leak detection
 Static shut-in test or other pressure or leak test
 Local operating personnel, procedures or equipment
 Remote operating personnel, including controllers
 Air patrol or ground surveillance
 A third party Other (specify) _____
3. Estimated leak duration days ____ hours ____

PART H – APPARENT CAUSE

Important: There are 25 numbered causes in this Part H. Check the box corresponding to the primary cause of the accident. Check one circle in each of the supplemental categories corresponding to the cause you indicate. See the instructions for guidance.

H1 – CORROSION

- | | | | |
|---|--|--|--|
| <p>1. External Corrosion</p> <p>2. Internal Corrosion</p> <p>(Complete items a – e where applicable.)</p> | <p>a. Pipe Coating
Bare
Coated</p> | <p>b. Visual Examination
Localized Pitting
General Corrosion
Other _____</p> | <p>c. Cause of Corrosion
Galvanic Atmospheric
Stray Current Microbiological
Cathodic Protection Disrupted
Stress Corrosion Cracking
Selective Seam Corrosion
Other _____</p> |
|---|--|--|--|
- d. Was corroded part of pipeline considered to be under cathodic protection prior to discovering accident?
 No Yes, Year Protection Started: _____
- e. Was pipe previously damaged in the area of corrosion?
 No Yes => Estimated time prior to accident: / _____ / years / _____ / months Unknown

H2 – NATURAL FORCES

3. Earth Movement => Earthquake Subsidence Landslide Other _____
4. Lightning
5. Heavy Rains/Floods => Washouts Flotation Mudslide Scouring Other _____
6. Temperature => Thermal stress Frost heave Frozen components Other _____
7. High Winds

H3 – EXCAVATION DAMAGE

8. Operator Excavation Damage (including their contractors/Not Third Party)
9. Third Party (complete a-f)
- a. Excavator group
 General Public Government Excavator other than Operator/subcontractor
- b. Type: Road Work Pipeline Water Electric Sewer Phone/Cable
 Landowner-not farming related Farming Railroad
 Other liquid or gas transmission pipeline operator or their contractor
 Nautical Operations Other _____
- c. Excavation was: Open Trench Sub-strata (boring, directional drilling, etc...)
- d. Excavation was an ongoing activity (Month or longer) Yes No If Yes, Date of last contact / _____ /
- e. Did operator get prior notification of excavation activity?
 Yes; Date received: / _____ / mo. / _____ / day / _____ / yr. No
 Notification received from: One Call System Excavator Contractor Landowner
- f. Was pipeline marked as result of location request for excavation? No Yes (If Yes, check applicable items i - iv)
- i. Temporary markings: Flags Stakes Paint
- ii. Permanent markings:
- iii. Marks were (check one) : Accurate Not Accurate
- iv. Were marks made within required time? Yes No

H4 – OTHER OUTSIDE FORCE DAMAGE

10. Fire/Explosion as primary cause of failure => Fire/Explosion cause: Man made Natural
11. Car, truck or other vehicle not relating to excavation activity damaging pipe
12. Rupture of Previously Damaged Pipe
13. Vandalism

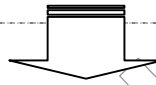
H5 – MATERIAL AND/OR WELD FAILURES

Material

- 14. Body of Pipe => Dent Gouge Bend Arc Burn Other _____
- 15. Component => Valve Fitting Vessel Extruded Outlet Other _____
- 16. Joint => Gasket O-Ring Threads Other _____

Weld

- 17. Butt => Pipe Fabrication Other _____
- 18. Fillet => Branch Hot Tap Fitting Repair Sleeve Other _____
- 19. Pipe Seam => LF ERW DSAW Seamless Flash Weld Other _____
HF ERW SAW Spiral



Complete a-g if you indicate **any** cause in part H5.

- a. Type of failure:
 - Construction Defect => Poor Workmanship Procedure not followed Poor Construction Procedures
 - Material Defect
- b. Was failure due to pipe damage sustained in transportation to the construction or fabrication site? Yes No
- c. Was part which leaked pressure tested before accident occurred? Yes, complete d-g No
- d. Date of test: _____ / yr. _____ / mo. _____ / day
- e. Test medium: Water Inert Gas Other _____
- f. Time held at test pressure: _____ / hr.
- g. Estimated test pressure at point of accident: _____ PSIG

H6 – EQUIPMENT

- 20. Malfunction of Control/Relief Equipment => Control-valve Instrumentation SCADA Communications
Block valve Relief valve Power failure Other _____
- 21. Threads Stripped, Broken Pipe Coupling => Nipples Valve Threads Dresser Couplings Other _____
- 22. Seal Failure => Gasket O-Ring Seal/Pump Packing Other _____

H7 – INCORRECT OPERATION

- 23. Incorrect Operation
 - a. Type: Inadequate Procedures Inadequate Safety Practices Failure to Follow Procedures
Other _____
 - b. Number of employees involved who failed a post-accident test: drug test: _____ / alcohol test: _____ /

H8 – OTHER

- 24. Miscellaneous, describe: _____
- 25. Unknown
Investigation Complete Still Under Investigation (submit a supplemental report when investigation is complete)

PART I – NARRATIVE DESCRIPTION OF FACTORS CONTRIBUTING TO THE EVENT (Attach additional sheets as necessary)

Blank area for narrative description of factors contributing to the event.

EXHIBIT C
METALLURGICAL REPORT

No distribution without permission from the client

Metallurgical Analysis of November 13, 2007 Leak on Line 3 at US MP 912.3188

Enbridge Energy Partners, L.P.
Final Report – 813 7608 1
May 22, 2008