National Transportation Safety Board
Office of Railroad, Pipeline and Hazardous Materials Investigations
Washington, DC 20594

PLD25FR001

# INTEGRITY MANAGEMENT

Group Chair's Factual Report

September 24, 2025

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## A. ACCIDENT

| | |
|---|---|
| Location: | 10593 S 3210 W, South Jordan, Utah |
| Date: | November 6, 2024 |
| Time: | 1509 MST<br>2109 UTC |
| Operator: | Enbridge Gas Utah |
| System Type: | Gas Distribution |
| Commodity: | Natural Gas |

## B. INTEGRITY MANAGEMENT GROUP

| | |
|---|---|
| Group Chair | Dane Spillers<br>National Transportation Safety Board<br>Washington, DC |
| Group Member | Jimmy Betham<br>Utah Department of Commerce, Division of Public Utilities,<br>Pipeline Safety Section<br>Salt Lake City, UT |
| Group Member | Reed Thompson<br>Utah Department of Public Safety, Office of the State Fire Marshal (Utah)<br>Sandy, UT |
| Group Member | Richard Kiser<br>Enbridge Gas Utah<br>Salt Lake City, UT |

## C. SUMMARY

On November 6, 2024, at 3:09 p.m. MST, a home explosion and fire in South Jordan, Utah killed a juvenile and destroyed the home. A neighboring home was also structurally damaged, and other homes in the area experienced minor damage. The South Jordan Fire Department responded within 5-minutes of the initial 911 call. Enbridge Gas Utah (Enbridge) arrived on-scene at 3:45 p.m. and worked continuously to find and isolate the leak. A leak was found and isolated at about noon the following day.

After the accident, a leak was found about 150-feet northeast of the accident home on a 4-inch diameter Aldyl A natural gas main that was manufactured and installed in 1976. The main was owned and operated by Enbridge and operated at a pressure of about 45 psig with an MAOP of 60 psig. Subsurface gas was detected between the main and two nearby residences, extending from the main to the backyard and front yard of each home. Enbridge observed subsurface gas indications as far as about 250-feet from the leak location. Natural gas at about 4% of the lower explosive level (LEL) was also detected inside the neighboring home to the north.

Utah Deputy State Fire Marshal interviewed the parents of the victim. One parent reported feeling dizzy and having headaches over the weekend prior to the explosion. She also reported lighting a candle on Tuesday evening (November 5th) and observing an unusually high flame which she quickly put out. All five residents were aware of what natural gas smells like, but none reported smelling gas prior to the explosion. They were not aware that natural gas alarms existed and did not have one in their home.

## D. FACTUAL INFORMATION

This report documents the facts, conditions, and circumstances relating to the accident which pertains to integrity management of the affected pipeline system.

### 1.0 Integrity Management Overview

Integrity management is a process that can be used to identify, assess, and manage pipeline risks (see Figure 1). Risk can be defined as a measure of the probability and severity of adverse events. Risks are evaluated by answering the following questions:

- What can go wrong?
- How likely is this to happen?
- If it does happen, what are the consequences?

These risks are then managed by gathering additional information, taking action to reduce risks, continuing to evaluate risks as they change, and improving the process over time. Integrity management programs can be iteratively improved over time as additional information is gathered, risks are better understood, and assessment techniques are further developed. In some cases, integrity management programs are required by regulation (See Section 65.0.0).

**Figure 1. Typical** Integrity Management Flowchart

## 2.0 Integrity Management Program

On November 10, 2024, the Integrity Management Group met at the Enbridge office in Salt Lake City to review the Enbridge Distribution Integrity Management Program (DIMP). On February 11, 2025, the Integrity Management Group met via virtual meeting to review a presentation on Enbridge's DIMP ESRI Relative Risk Model results and the mapping of those results to the natural gas distribution system in the company's DIMP web map.

Enbridge's DIMP for Utah was specific to the gas distribution assets in their Utah-Idaho-Wyoming-Colorado service territory. The program used company knowledge of the system and operating environment to identify threats and evaluate the relative risk of those threats to people and property. After estimating the relative risk, Enbridge DIMP staff met with company subject matter experts (SMEs) to discuss the results and other relevant information to identify region specific threats and relative risk estimates. The SME-determined regional relative risk results are used to prioritize accelerated actions needed to manage risk. These risk reduction actions are then implemented and tracked on a regional or system-wide basis. This accident occurred in the Enbridge Gas Utah Western Region. Enbridge also measured

performance, monitored results, and evaluated the program's effectiveness. An overview of the elements in Enbridge's DIMP is shown below.[1]

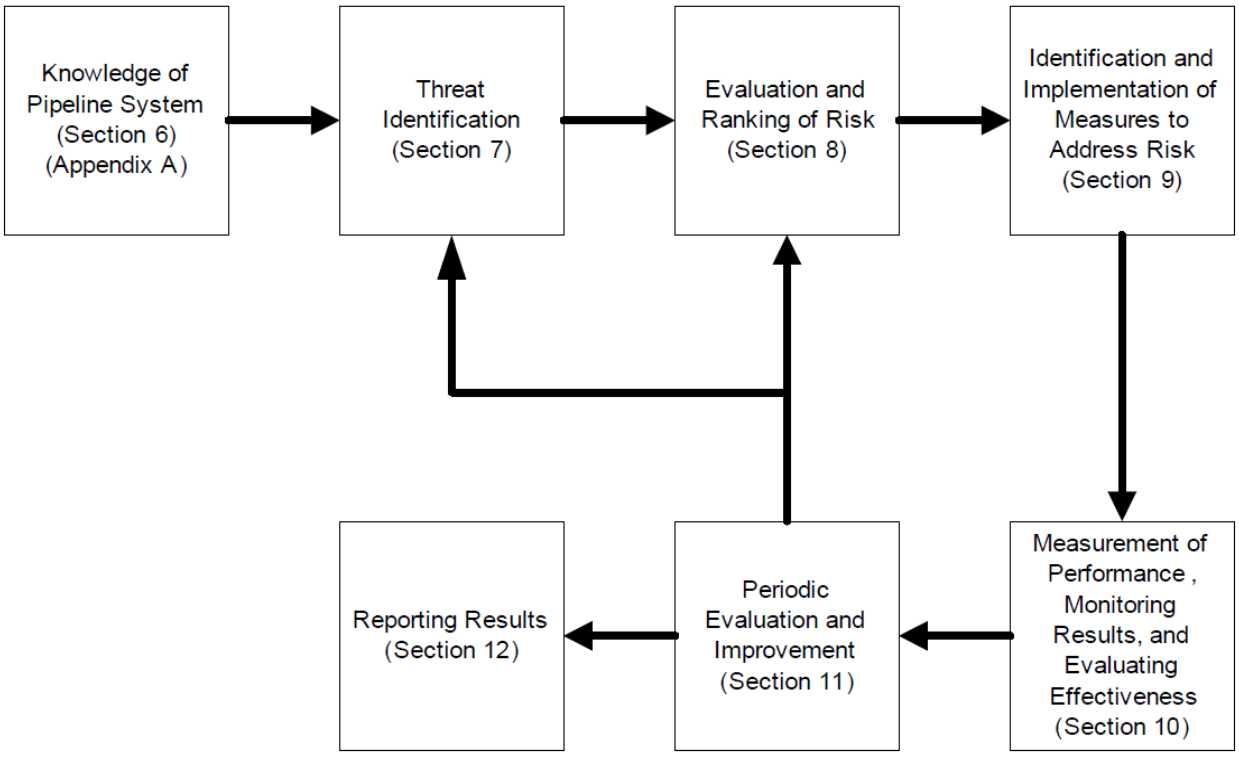


**Figure 2-Enbridge Gas Utah DIMP Elements**

The Enbridge DIMP risk review process is completed for its natural distribution annually with a focus on gas mains and services in odd years and high-pressure distribution systems on even years. The DIMP process is completed for the high-pressure distribution system in the alternate years. The most recent DIMP risk results calculated prior to the accident were in May 2023. A typical schedule includes updating the model data in the first quarter of the year, running the relative risk model in May, meeting with SMEs for each region in May and June. In July, the process is typically completed and any additional accelerated actions identified, if needed.

[1] Enbridge Gas Utah Distribution Integrity Management Plan

The DIMP program is facilitated by a DIMP engineer that had been in this position for about 5 years. The program works in collaboration with SMEs (corrosion, damage prevention, etc.). The figure below shows the Enbridge DIMP team.

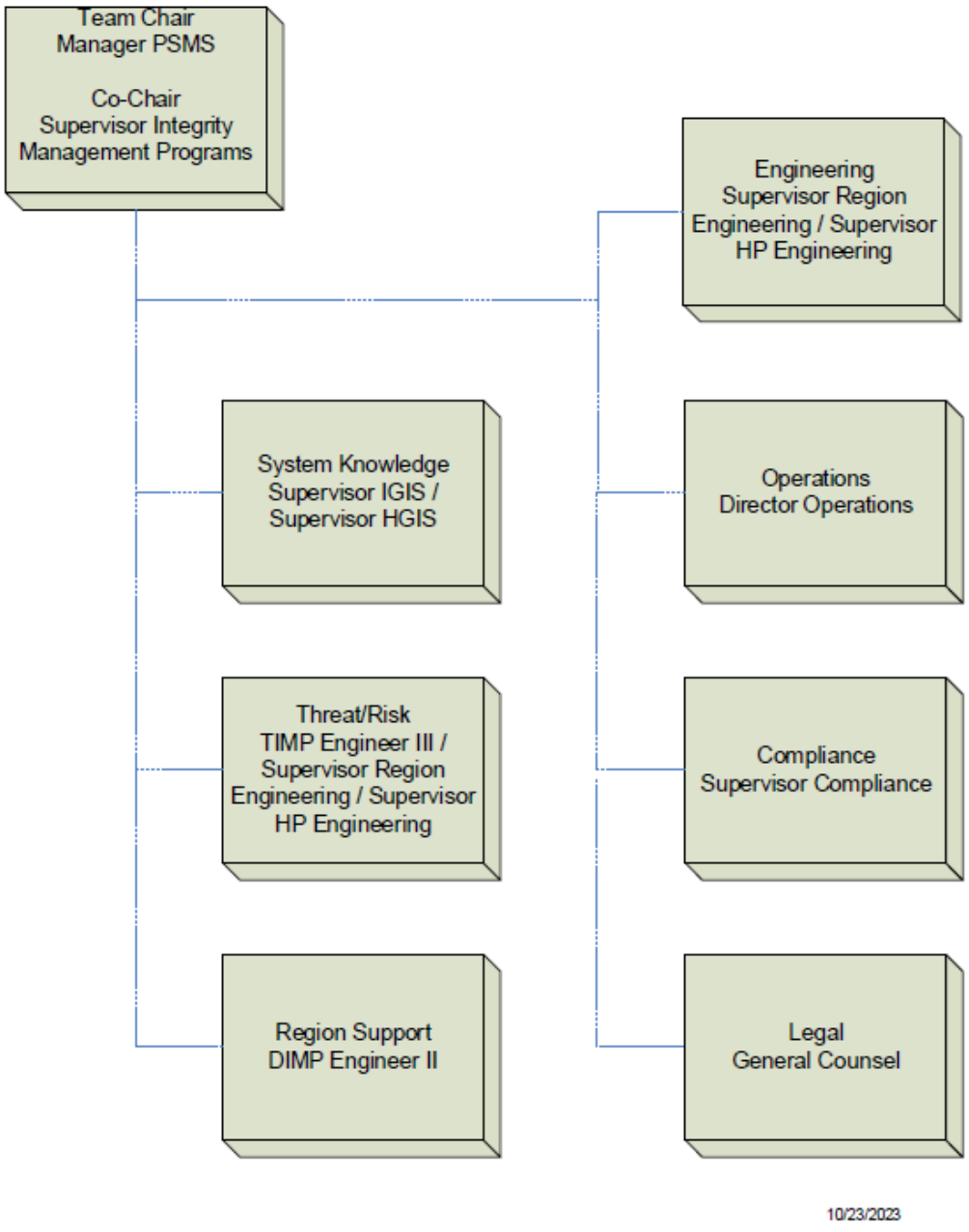


**Figure 3-Enbridge Gas Utah DIMP Team[2]**

[2] Enbridge Gas Utah Team organization chart provided by Enbridge Gas Utah

## 2.1 Risk Identification

Risk assessments are based on the current understanding of the system, the operating environment, and potential threats. This section documents the risk identification process used by Enbridge in its most recent assessment.

### 2.1.1 System Knowledge

Enbridge's 2023 DIM Report provides information by approximate region. Due to limitations in how the data is gathered, some region's data included assets that cross into other regions. In the Western Region, the data includes some assets in the Salt Lake and Central region (due to county boundaries). Enbridge designed their DIM program by county boundaries because the county provides a stable boundary over time while company regional boundaries may change.

According to Enbridge's 2023 DIM Report, they operated about 46,330,608 feet of main in the Western Region, and 529,467 service lines. Of these, the material of construction was known for all mains; the majority of which were plastic.

| | Steel | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | Unprotected | | Cathodically Protected | | | | | |
| | Bare | Coated | Bare | Coated | Plastic | Cast Iron | Other | Total |
| Feet of Main | 0 | 0 | 0 | 8,481,985 | 37,848,623 | 0 | 0 | 46,330,608 |
| No. of Services | 0 | 0 | 0 | 76,185 | 451,260 | 0 | 22 | 529,467 |

**Figure 4 Enbridge Gas Utah Distribution Assets from 2023 DIM Report**

Of the plastic mains in the Western Region (includes Utah County and Salt Lake County), 8,961,233 feet (1697 miles) were Aldyl A[3].

**Main Footage**

| Material | Unknown | 2" or Less | Over 2" thru 4" | Over 4" thru 8" | Over 8" thru 12" | Over 12" | Total |
|---|---|---|---|---|---|---|---|
| Steel | 0 | 5,504,094 | 2,126,077 | 658,255 | 63,883 | 127,324 | 8,479,633 |
| Steel – TWRT | 0 | 0 | 2,352 | 0 | 0 | 0 | 2,352 |
| Steel – XT | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Cast Iron | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Plastic PE – AL | 0 | 7,320,591 | 1,569,022 | 71,620 | 0 | 0 | 8,961,233 |
| Plastic PE – TR | 0 | 21,950,016 | 5,089,431 | 1,847,943 | 0 | 0 | 28,887,390 |
| Total | 0 | 34,774,701 | 8,786,882 | 2,577,818 | 63,883 | 127,324 | 46,330,608 |

**Figure 5- Gas Distribution Mains from the 2023 DIM Report**

The table below includes all Aldyl A in the Utah, Idaho, Wyoming, Colorado by diameter and year installed as of the time of the accident.

[3] Footage of Aldyl A mains in other regions: Central Region -- 651,708; Eastern Region -- 29,865 + 177,684 + 222,007; Northern Region -- 2,591,672 + 1,067,270; Salt Lake Region -- 10,756,065; Southern Region -- 706,754 + 1,776,095 + 1,314,517; Wyoming Region -- 675,395 + 742,198 + 557,532.

| Year | 1/2" | 3/4" | 1" | 1 1/4" | 2" | 3" | 4" | 6" | 8" | Total |
|---|---|---|---|---|---|---|---|---|---|---|
| **1969** | | 607 | 4,864 | 2,323 | 10,862 | 18,470 | 13 | | | 37,139 |
| **1970** | | 604 | 14,710 | 3,403 | 8,668 | 7,854 | 12,928 | | | 48,167 |
| **1971** | | 25 | 18 | 3,295 | 5,239 | 1 | 3,074 | 3,747 | | 15,399 |
| **1972** | 151 | 287 | 15,112 | 108,367 | 396,510 | 14,632 | 30 | 138 | | 535,227 |
| **1973** | 120 | 621 | 2,070 | 170,610 | 621,786 | 49,763 | 62,538 | 3 | | 907,511 |
| **1974** | 190 | 2,049 | 71 | 139,076 | 576,641 | 85,959 | 183,171 | | | 987,157 |
| **1975** | 47 | 2,431 | 271 | 130,968 | 594,303 | 77,904 | 149,027 | 7 | | 954,958 |
| **1976** | 117 | 6,477 | 636 | 184,677 | 798,087 | 81,937 | 118,914 | 12 | 3 | 1,190,860 |
| **1977** | 8 | 1,124 | | 221,854 | 781,327 | 90,485 | 138,759 | 3 | 5 | 1,233,565 |
| **1978** | | 2,550 | | 211,937 | 728,721 | 99,374 | 148,200 | 4 | 1 | 1,190,787 |
| **1979** | 54 | 2,076 | | 226,431 | 773,754 | 117,979 | 256,782 | 10 | | 1,377,086 |
| **1980** | 10 | 3,133 | | 144,660 | 613,177 | 108,305 | 271,179 | 2,359 | 1 | 1,142,824 |
| **1981** | | 2,001 | | 107,269 | 472,327 | 81,110 | 158,574 | 14,130 | | 835,411 |
| **1982** | 156 | 1,060 | | 88,690 | 269,044 | 47,571 | 149,328 | 26,627 | | 582,476 |
| **1983** | | 2,836 | | 119,951 | 298,344 | 56,180 | 105,413 | 12,390 | | 595,114 |
| **1984** | | 593 | | 141,666 | 227,763 | 32,942 | 81,717 | 15,336 | | 500,017 |
| **1985** | | 910 | | 91,913 | 221,884 | 34,396 | 80,145 | 2,415 | | 431,663 |
| **1986** | 93 | 1,137 | | 128,457 | 252,374 | 27,252 | 62,588 | 12,227 | | 484,128 |
| **1987** | 374 | 1,340 | 108 | 287,214 | 1,816,178 | 95,695 | 223,040 | 86,971 | 1 | 2,510,921 |
| **1988** | 59 | 4,742 | | 121,573 | 820,754 | 73,126 | 232,771 | 30,725 | 2 | 1,283,752 |
| **1989** | 4 | 433 | | 115,662 | 632,710 | 31,849 | 119,997 | 39,446 | | 940,101 |
| **1990** | | 233 | | 141,001 | 385,287 | 17,600 | 80,971 | 15,902 | 1 | 640,995 |
| **1991** | | 2,141 | | 170,870 | 411,963 | 31,132 | 148,742 | 8,203 | 3 | 773,054 |
| **1992** | | 899 | | 185,297 | 562,780 | 57,499 | 91,686 | 18,454 | 1 | 916,616 |
| **1993** | | 4,080 | | 204,989 | 407,675 | 44,140 | 127,676 | 7,111 | 4 | 795,675 |
| **1994** | | 3,459 | | 171,483 | 220,020 | 22,131 | 63,865 | 5,463 | | 486,421 |
| **1995** | 68 | 983 | | 15,467 | 53,259 | 4,692 | 14,918 | 1,346 | | 90,733 |
| **1996** | | 3,964 | | 2,341 | 22,607 | 351 | 2,575 | 1,865 | | 33,703 |
| **1997** | 243 | 73 | | 1,462 | 6,261 | | 6,836 | 366 | 1 | 15,242 |
| **1998** | | | | 455 | 1,788 | 916 | 179 | 2 | | 3,340 |
| **1999** | | 58 | | 8 | | | | | | 66 |
| **2001** | | 137 | | 1,883 | 47,583 | | 2,004 | | | 51,607 |
| **Total** | 1,694 | 53,063 | 37,860 | 3,645,252 | 13,039,676 | 1,411,245 | 3,097,640 | 305,262 | 23 | 21,591,715 |

**Figure 6-Aldyl A main footage (2023 data)[4]**

[4] Aldyl A Main footage by year of install provided by Enbridge Gas Utah

The footage of Aldyl A main in Enbridge's distribution system in this Utah-Idaho-Wyoming-Colorado area by year is shown in the figure below (solid lines are read off the left y-axis; dashed lines off the right).

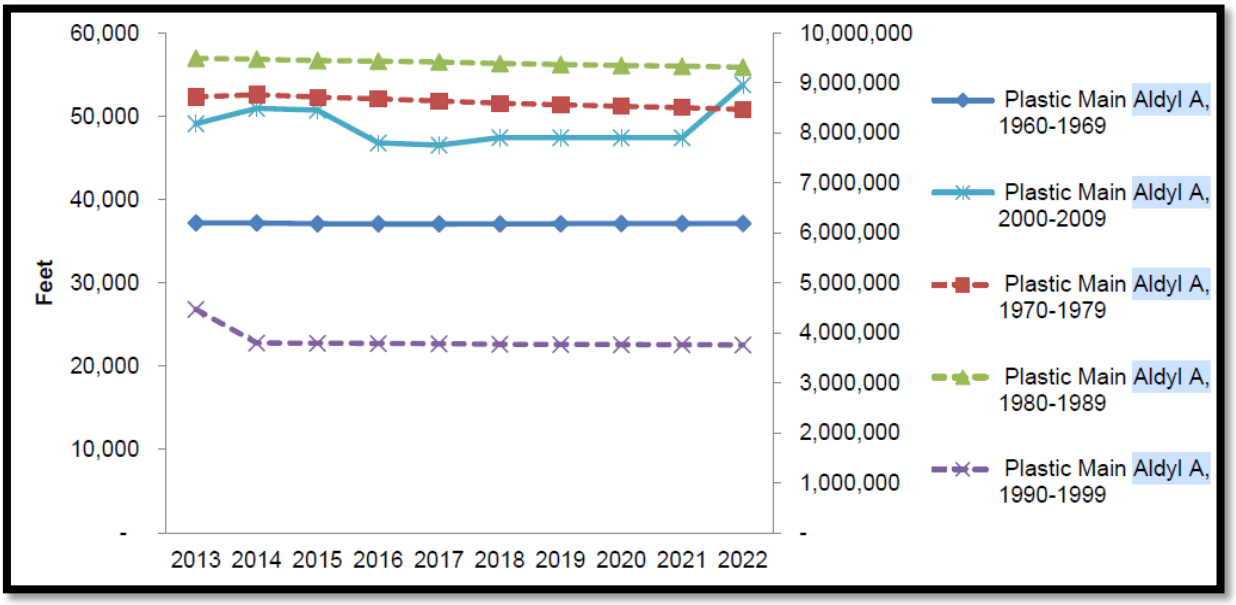


**Figure 7 Distribution System Aldyl A Main Pipe Footage by year[5]**

Note- for Figure 7 above, the Increase in 2000-2009 Aldyl A main footage from 2012-2018 is records correction for material from Utah Gas acquisition, 2000-2009 main across all materials decreased during this time period. Similar increase between 2021 and 2022 is for the same reason.

Several data sources are used as part of the Enbridge threat evaluation including the sources listed below:

- CORE Database - a sample of the information contained on mains and services includes leaks data, damage data, and external corrosion.
- Geographic Information System (GIS) - a sample of the information contained on mains and services includes location, pipeline characteristics and installation dates.
- Census data
- NTSB Investigation Reports
- PHMSA Notices and Advisory Bulletins
- Trade publications, like American Gas Association Plastic Pipeline Database Committee Reports

[5] 2023 Distribution Integrity Management Report 2023 provided by Enbridge Gas Utah

- System Operation data including, but not limited to leak data, high/low pressure events, and facility inspection

  The DIM Plan section 7.3.2 includes a listing of the data sources used.[6]

An overhead view of the accident site with Enbridge assets highlighted is shown below. The 4-inch diameter Aldyl A main involved in this accident is shown in bolded green and is running North-South in the middle of the road (3200 W) in Figure 8 below. The accident home is labelled by street address,10593 South 3210 West. The print line from adjacent Aldyl A is shown in Figure 9 below.

**Figure 8-Gas distribution system near 10593 S 3210 W (street)**

[6] Enbridge Gas Utah Integrity Management Plan for Natural Gas Distribution Pipeline System

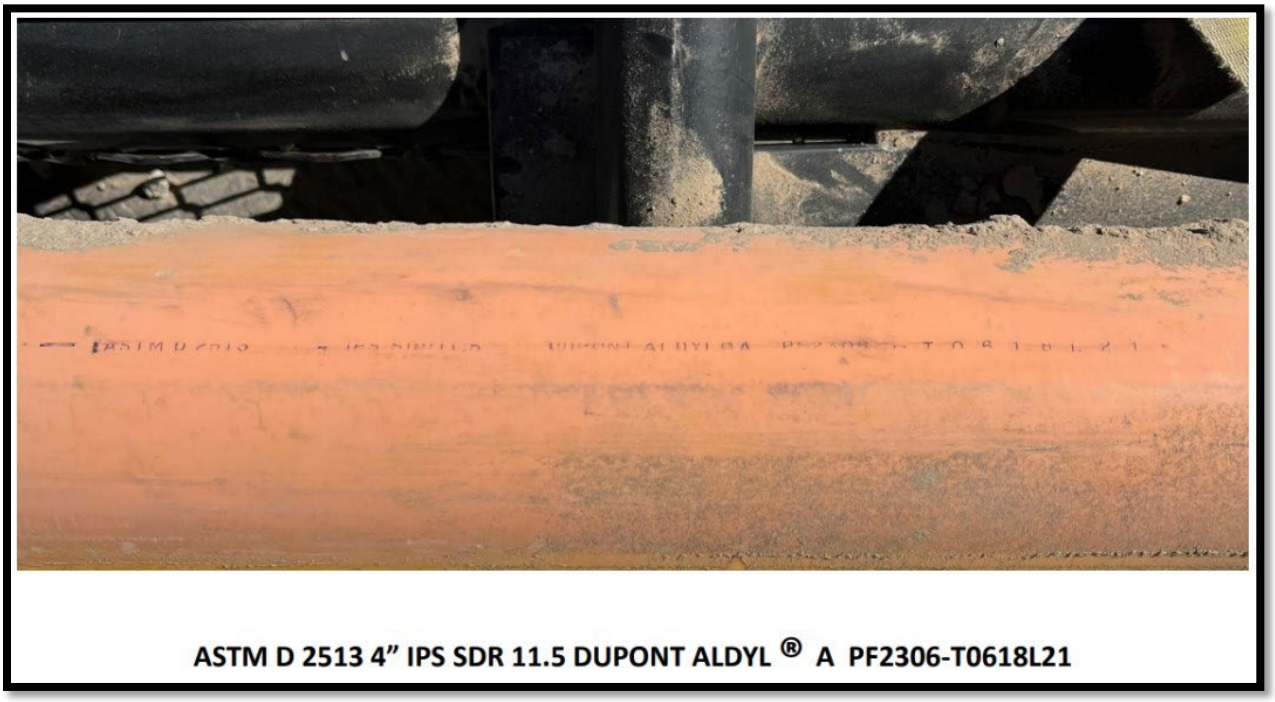


**Figure 9-Print line from leaking 4-inch Aldyl A pipeline[7]**

## 2.2 Threat Identification

Enbridge considered the following threats, which align to those defined by PHMSA.[8]

a. Corrosion
b. Natural Forces
c. Excavation Damage
d. Other Outside Force Damage
e. Pipe, Weld, or Joint Failure (including compression coupling)
f. Equipment Failure
g. Incorrect Operation
h. Other Concerns.

## 2.3 Risk Assessment

Enbridge uses a relative risk model developed by ESRI in 2010. Enbridge staff made some minor updates to the model a few years ago. The ESRI methodology is described in the ESRI DIMP Toolset[9]. The factors used in the Enbridge risk model

[7] Image provided by Enbridge Gas Utah
[8] Enbridge Utah Gas DIMP Section 7.2.1
[9] ERSI DIMP Toolset Documentation Version 1.3 RiskFrame® DIMP Modeler : Distribution Integrity Management Program Risk Modeling

have been modified to include additional views of Aldyl A pipe. Enbridge identified Aldyl A ("P-AL") as a specific material type that they tracked separately in their initial DIMP model (they do not roll Aldyl A into the more generic category, Polyethylene). All risk factors used by Enbridge in their model are included in a spreadsheet and loaded into the model.[10] The model used separate likelihood and consequence factors. Consequence factors used include population density, business district, pipe diameter, and critical structures (schools, churches, hospitals, nursing homes, correctional facilities) within 150 feet. Assets that have unknown attributes are assigned higher scores which has, over time, prompted the staff to work to confirm unknown information to improve the model.

The ESRI risk model uses leak data (including leaks that result in incidents), as well as information about the associated pipeline and its location. The results are calculated based on 25-foot square grids. During the February 11, 2025, presentation, the grid results near the accident were reviewed.

Although the DIMP model uses 10-year leak history, a post incident review of 11 years of leak data from 2013-2023 was conducted. When this 11-year leak data was filtered by material (Aldyl A), location (South Jordan), and type (mains), excluding excavation damage, 13 leaks were indicated. When reviewed for the entire system, and filtered for text indicating "rock impingement," 86 leaks were indicated from 2013-2023 on approximately 4,000 miles of main. Enbridge has provided a spreadsheet of leaks for entire system, for the last 10 years, with all available data.[11] Currently when leaks are isolated using a squeeze off, Enbridge Gas Utah utilizes a split sleeve to reinforce the squeeze off location to prevent a potential future leak.[12]

The Enbridge Integrity Management team shared the risk results obtained through their ESRI model with company SME's during regional meetings. These meetings last approximately 4-5 hours and are performed in each region. They include various SMEs, such as engineering, integrity management, operations, corrosion and damage prevention. The regional SME team reviewed the relative risk results and historical information for their assets and industry and focused on threats for their specific region. The IM team and SME team determined the overall risk to their assets by identified threat during this meeting; the results are shown in the DIM Report, Appendix C. For example, the risk of a Material, Weld, or Joint Failure, Sub-threat Aldyl A (the category included rock impingement of Aldyl A) in the Western Region was assigned a likelihood value of 4, a consequence value of 4, for an overall relative risk score of 16. The available likelihood and consequence scores ranged from 1-10. The resulting range of relative risk scores ranged from 1-100.

[10] Risk Factor Summary provided by Enbridge Gas Utah
[11] Leak Data Analysis provided by Enbridge Gas Utah
[12] Enbridge Gas Utah Standard Practice 2-33-07

The ESRI and SME relative risk models were used to manage integrity risks at the time of the accident. Enbridge is migrating to a probabilistic risk assessment model and had contracted with Jana to replace the ESRI relative risk model in 2026. Enbridge provided a summary information scope of work for this in-place contract.

## 2.4 Risk Management

Pipeline risks are managed through completing targeted assessments, reducing risks through repairs, replacements, or other risk reduction actions, continual evaluation, and improvement.

Several of Enbridge's regions, including the Western Region, identified some generations of Aldyl A pipe are prone to rock impingement failures. The type and method of backfill during construction, if known, can be useful to locate Aldyl A locations with elevated cracking potential. However, the type of backfill is often not known, particularly for older installations. The current Enbridge construction standard practices require sand bedding with 4-inches of sand below the pipe, a practice that has been in effect since about 1983. As far back as 1972, Enbridge standard practice required care to be taken when backfill material contained rocks.[13]

Enbridge Gas Utah DIM Report, Appendix C notes the specific concerns, "Aldyl A more prone to rock impingement and failure."[14] There's an associated accelerated action that doesn't apply to the accident pipe; it only applies to Low Ductile Inner Wall (LDIW) Aldyl A which could have been installed until 1975. Enbridge Gas Utah noted that despite differences in scores from the SME model, all items are typically acted upon. Enbridge Gas Utah provided a summary of accelerated actions taken related to Aldyl A prior to the accident.[15]

At the time of the accident, Enbridge did not have a formal Aldyl A replacement program. Enbridge has not proposed such a program to the state utility commission. Enbridge has done targeted Aldyl A replacement projects, as a part of their normal capital spending program, with the costs recovered during subsequent rate cases. A more extensive Aldyl A replacement program would require collaboration with the applicable Public Service Commission.

# 3.0 Procedures

The Enbridge Distribution Integrity Management Plan is the primary driver for the Enbridge risk modeling and assessment of the gas distribution system.[16]

[13] Enbridge Gas Utah Standard Practice 2-17-02 Excavation and Backfilling, Backfilling instruction
[14] Enbridge Distribution Integrity Management Report Appendix C
[15] DIMP Acceleration actions (Aldyl A) provided by Enbridge Gas Utah
[16] Enbridge Gas Utah Integrity Management Plan for Natural Gas Distribution Pipeline System

Enbridge also has used the 1999 GTI study on Aldyl A as a reference for their DIMP program.

### 3.1 Post-Incident Engineering studies

NTSB has conducted material testing of the failed gas service assets from the incident locations. For a summary of the testing, refer to the *Materials Laboratory Factual Report* within the docket.

## 4.0 Industry Guidance and Consensus Standards

There are several industry guidance documents and consensus standards available to help pipeline operators implement their pipeline safety integrity management programs. Some examples include:

- American Society of Mechanical Engineers (ASME) B31.8S, Managing System Integrity of Gas Pipelines. This code is designed to provide operators with the information necessary to develop and implement an effective integrity management program utilizing proven industry practices and processes. It applies to onshore pipeline systems constructed with ferrous materials that transport gas. However, the principles and processes are applicable to all pipeline systems.
- PHMSA, *Pipeline Risk Modeling Overview of Methods and Tools for Improved Implementation*, February 1, 2020
- ANSI/GPTC Z380.1, *Guide for Gas Transmission, Distribution, and Gathering Piping Systems,* Appendix G-192-8 Distribution Integrity Management Program (DIMP) (current edition)
- Integrity Management for Gas Distribution, Report of the Phase 1 Investigations, December 2005
- AGF Study "Safety Performance and Integrity of the Natural Gas Distribution Infrastructure." January 2005
- White Paper- "Correlating Aldyl 'A' and Century PE Pipe Rate Process Method Projections with Actual Field Performance," E.F. Palermo, Ph.D., Plastics Pipes XII Conference, April 2004, available at https://www.aga.org/wp-content/uploads/2022/12/gptctechpaper.pdf

## 5.0 Safety Oversight

### 5.1 Federal Pipeline Safety Requirements and Guidance

Federal pipeline safety regulations are found in 49 *CFR* Parts 190-199. Integrity management requirements are included in 49 CFR Part 192, Transportation of

Natural and Other Gas by Pipeline: Minimum Federal Safety Standards, Subpart P, Gas Distribution Pipeline Integrity Management.

PHMSA has issued the following Advisory Bulletins related to premature cracking of older plastic pipe:

- ADB-07-01, *Updated Notification of the Susceptibility to Premature Brittle-Like Cracking of Older Plastic Pipe*: This advisory bulletin called operators' attention to cracking issues on pipe and components manufactured by Century Utility Products, Inc.; low ductile inner wall ''Aldyl A'' piping manufactured by Dupont before 1973; polyethylene gas pipe made from PE 3306 resin; Delrin insert tap tees; and caps made of Celcon (polyacetal) on Plexco service tees.
- ADB-02-07, Notification of the Susceptibility to Premature Brittle-Like Cracking of Older Plastic Pipe

### 5.2 State Pipeline Safety Requirements, Guidance, and Inspection

The state of Utah enforces the PHMSA Integrity Management requirements along with the other regulations in 49 CFR Part 192.

With assets operating in other states, the Enbridge Gas Utah Integrity Management Plan is also reviewed by Wyoming and Idaho.

Utah pipeline safety inspects Enbridge's DIMP every 5 years and the implementation of the DIMP about every year. During these inspections in 2021 the Utah state inspectors recommended that the risk of certain vintages of Aldyl A should be higher than determined by the Enbridge risk process.[17]

## 6.0 Historical Records

### 6.1 Leak and Failure History

Relevant leak and failure history was reviewed and is documented in section 2.3 above.

## 7.0 Post-accident Actions

Enbridge has initiated several post-accident safety actions to address potential threats and evaluate their system. It should be noted; Enbridge was in the process of migrating to a probabilistic risk model in 2026 for their Distribution Integrity

[17] LDC DEU DIMP Plan Inspection 2021-Results and Notes Review

Management Program which will not be listed in the new safety actions listing below. The safety actions that were identified and planned after the accident are listed below.

After the initial response to the accident, Enbridge conducted a leak survey of the area as described in the Emergency Response Factual report. No below ground leaks were found. Enbridge also planned the replacement of the 4-inch gas main along 3200W (street) and has completed the replacement of approximately 1,000 feet of the early vintage 4-inch Aldyl A main and four Aldyl A services on that main section on November 18, 2024.

Standard Procedure 10-10-02 Leak Screening Practice has been revised to require leak screening around the perimeter of any structure associated with the leak screen. In addition, it includes investigation of other gas facilities in the area which are not serving the structure.

Standard Practice 3-75-01 Underground Gas Leak Procedure graphic has been updated to reflect bar hole testing at the corners of a structure should natural gas be found near the perimeter during a leak screen.

The Risk Analysis for all early vintages of Aldyl A assets has been updated and separated into groups that reflect the crack growth resistance of the material.

First generation Aldyl A was produced from 1966 to 1970 from a resin that had a low resistance to slow crack growth. Enbridge installed the first generation of Aldyl A starting in 1969. The risk analysis conservatively considers that it could have been installed until 1973. Second generation Aldyl A was produced from 1970 to 1983 from a resin that had an improved resistance to slow crack growth compared to first Generation Aldyl A. Enbridge installed second generation Aldyl A starting in 1970 and in its risk analysis conservatively considers that it could have been installed until 1986.

A risk analysis was performed using the 11-year leak history. The risk analysis separated the results into three categories:

1. Denoted as High-High. 548 miles of piping. High Risk-areas with hot spots (areas with histories of leakage)
2. Denoted as High. 1,269 miles. High Risk-areas with no relevant leakage history
3. Denoted as Medium. Medium Risk areas not included in 1 or 2 above.

The risk analysis is being used to inform accelerated leak survey frequency and the replacement process for assets in risk categories 1 and 2.

An Advanced Mobile Leak Detection (AMLD) system has been implemented to enhance leak detection capabilities. The AMLD system uses parts-per-billion leak detection sensors and an algorithm along with environmental conditions at the time of the survey to evaluate the survey area for potential natural gas leaks which are then investigated by the Enbridge leak survey team to determine if a leak exists on the system in the indicated area. If a leak is found it is graded (based on the location and conditions of the leak) and scheduled for repair. Traditional leak survey equipment uses parts-per-million sensors.

The AMLD survey has been completed on 548 miles of main covering all Aldyl A main piping and the associated service lines identified in the risk analysis as High-High and is underway on the 1,269 miles of main to survey all the High risk Aldyl A main piping and the associated service lines.

Once the survey of the High-risk piping is completed, the High-High-risk piping will be surveyed for a second time this year. In 2026, Enbridge plans to repeat these surveys and survey all Medium-risk Aldyl A main piping and associated service lines. The frequency of these AMLD surveys will be determined based on the data collected from the surveys completed in 2025.

Submitted by:

Dane Spillers
Integrity Management Group Chair