Issued: August 11, 2025 Pipeline Investigation Report: PIR-25-03

Enbridge Inc. Natural Gas–Fueled Building Explosion

Location	Youngstown, Ohio
Date	May 28, 2024
System type	Natural gas distribution
Accident type	Rupture/release
Pipeline operator	Enbridge Gas Ohio (Enbridge Inc.)
Hazardous materials	Natural gas
Fatalities	1
Injuries	9
Property damage	$42 million

1 Factual Information

1.1 The Accident

On May 28, 2024, about 2:44 p.m. local time, a natural gas–fueled explosion at the Realty Building in Youngstown, Ohio, caused 1 fatality and 9 injuries that required hospitalization.[1] The natural gas originated from a 1-inch-diameter steel service line (accident service line) in the building's basement.[2] The explosion also caused significant structural damage to the building, which contained a Chase Bank and 22 apartment residences. Weather conditions at the time of the accident were 70°F with 14-mph winds and no precipitation.

1.1.1 Natural Gas Distribution System

Dominion Energy Inc. subsidiary Dominion Energy Ohio operated the natural gas distribution system in the area of the accident until March 2024, when the company was purchased by Enbridge Inc. and became the subsidiary Enbridge Gas Ohio.[3] At the time

[1] All times in this report are local. Visit ntsb.gov to find additional information in the public docket for this NTSB accident investigation (case number PLD24MR005), including detailed factual reports about the circumstances of the accident.

[2] *Service lines* transport gas from the distribution system to a customer.

[3] This report uses the current company name, Enbridge, throughout.

of the accident, Enbridge provided natural gas to the businesses and residences in the 13-story Realty Building through a 3-inch-diameter steel main and a 2-inch-diameter plastic service line, referred to in this report as the active service line, which led to a bank of gas meters on the east side of the building.[4] (See figure 1.) The accident service line was pressurized with natural gas to about 38 pounds per square inch, gauge, below the maximum allowable operating pressure of 60 pounds per square inch, gauge.

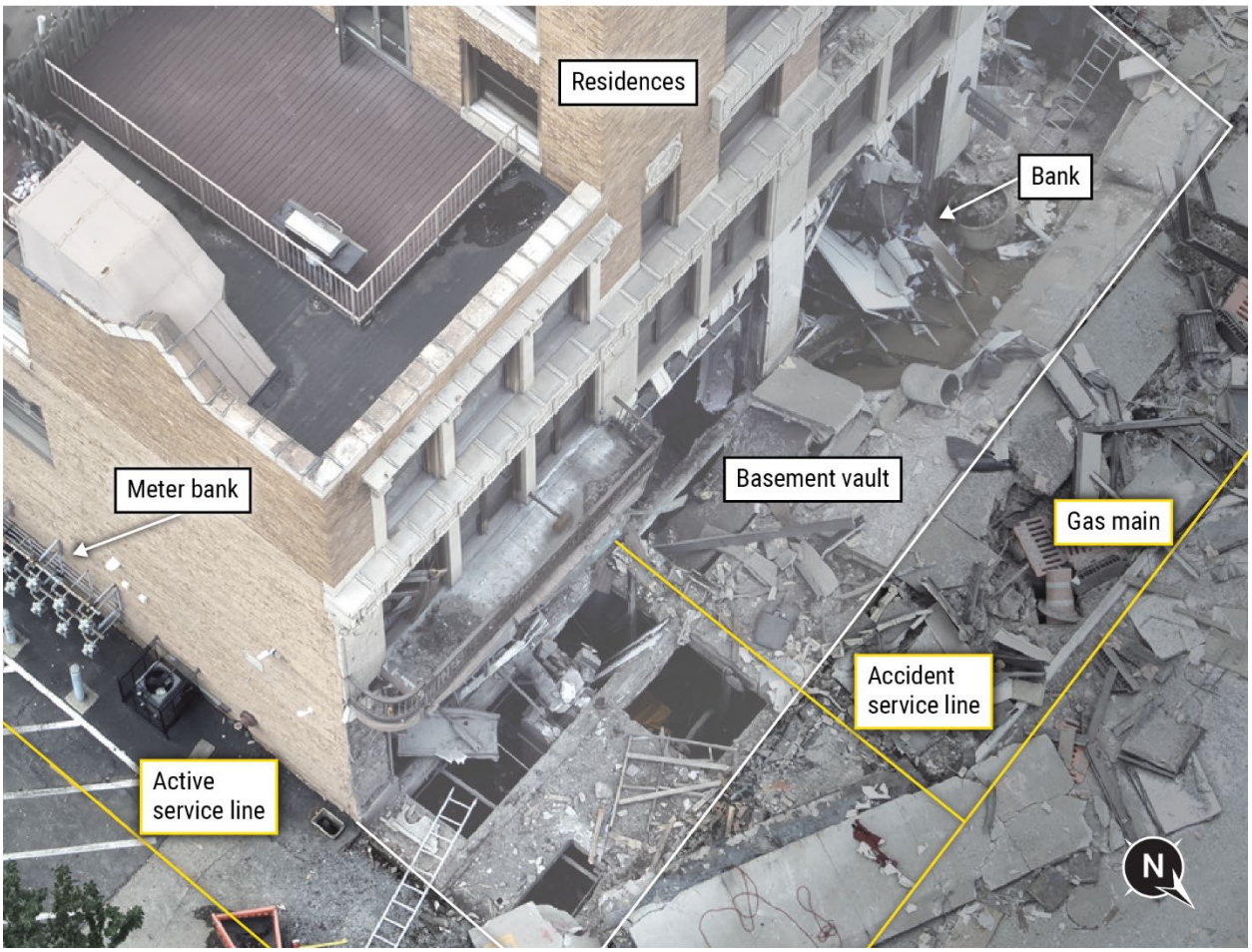

Figure 1. Realty Building after the explosion, with approximate locations of underground assets depicted in yellow. (Source: Mahoning County Sheriff's Office.)

The National Transportation Safety Board (NTSB) reviewed Enbridge records, which contained a September 2015 service line cut order: a work order for the accident

[4] A *main* is a natural gas distribution pipeline that serves as a common source of supply for more than one service line.

service line to be physically disconnected from the main.[5] The records indicated that the curb valve was closed and the accident service line disconnected at that time.

Typically, such work orders were assigned to a crew that would perform and document the completed work in the electronic customer care system. Enbridge representatives stated that this work order had been entered manually into the system in September 2015 by a customer relations employee. They further stated that a manual entry like this was generally associated with paper documentation but that they did not find such documentation.

1.1.2 Accident Sequence

Just before the accident, a four-person scrap-removal crew, engaged by contractor GreenHeart Companies LLC (GreenHeart), was working in a basement underneath the sidewalk section northeast of the Realty Building.[6] GreenHeart, which was contracted by the City of Youngstown to fill in the building basement vaults in preparation for a city road improvement project, had directed the scrap-removal crew to remove scrap materials such as wiring, pipes, and bricks from the basement.

A January 18, 2024, design locate request, to the utilities protection service Ohio 811 on behalf of the City of Youngstown, described the planned work as the abandonment of utilities vaults.[7] An Enbridge contract locator had marked some of the nearby natural gas assets in yellow paint on January 23, 2024, and again on May 4, 2024, but the accident service line was not marked either time.[8] (See figure 2.)

[5] The meter associated with the service line had been disconnected and removed in 2008 during a remodeling project. A pipeline that is permanently removed from service is also called abandoned.

[6] GreenHeart was partial owner of the Realty Building, which has since been demolished.

[7] A *design locate request* is submitted to a utilities protection service to provide general information about underground utilities locations, generally as part of project planning. Title 49 *Code of Federal Regulations* 192.614 requires pipeline operators to participate in qualified utilities protection services like Ohio 811 that use data from utility owners to identify underground assets.

[8] Records indicate the markings were associated with locate requests submitted on January 18 and May 1 related to the city project. A *locate request* for underground utilities to be located and marked before excavation is submitted to a utilities protection service separately from a design request.

Figure 2. Pavement markings on May 4, 2024. (Source: Ohio 811.)

In interviews with the NTSB, GreenHeart employees stated that they were not aware that there was natural gas in any of the pipelines in the Realty Building basement, noting that the accident service line appeared old and rusty and did not have a gas meter. (See figure 3.) The scrap-removal crewmember stated he used a saw to cut into one of the pipes that his project supervisor had told him was inactive, or "dead," but partway through the process, the crewmember heard a loud whistling sound and felt gas blowing into his face from the cut pipe.

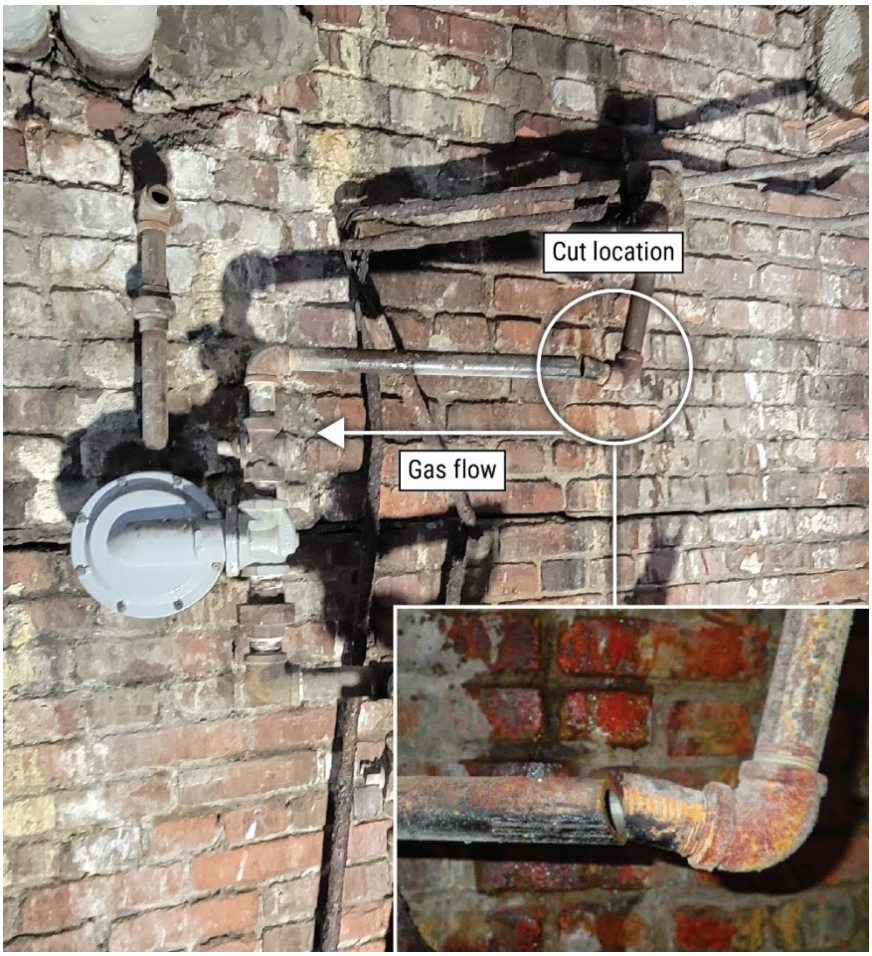

Figure 3. The accident service line. (Source: Public Utilities Commission of Ohio.)

The scrap-removal crew immediately exited the basement area and called 911 to report the gas leak.[9] About 2:39 p.m., as they exited, a crewmember pulled the fire alarm on the first floor, which alerted building residents of the emergency. The alarm did not sound in the building's commercial spaces, which included Chase Bank on the first floor.[10] Video footage showed crewmembers speaking with bank employees and pounding on the windows of the bank to notify employees of the gas leak between 2:42 and 2:43 p.m.

The video footage showed that one of the eight on-site Chase Bank employees evacuated upon being warned about the gas leak. The other seven remained inside the

[9] The Youngstown Fire Department also received gas odor reports from the public, and notification from the Realty Building fire alarm, just before the explosion.

[10] In accordance with building codes, the fire protection system in Chase Bank was a separate system from that of the residential building. At least one Chase Bank employee had heard the residential fire alarm and left the bank to investigate the situation before returning to the building.

Realty Building for about 2 minutes, packing up offices and alerting coworkers. These employees were still inside at the time of the explosion about 2:44 p.m.; one employee was standing near the bank's main entrance door and was killed when the floor he was standing on collapsed into the basement space. All but one of the apartment occupants evacuated before the explosion. Two of the Chase Bank employees sustained serious injuries, and five sustained minor injuries. One of the apartment occupants and one employee of the hotel across the street also sustained minor injuries.

1.2 Emergency Response

Emergency response teams from the Youngstown Fire Department, Youngstown Police Department, Emergency Medical Transport, Mahoning County Sheriff's Office, and Boardman Fire Rescue District responded to the accident, establishing an incident command and transporting victims to local hospitals for treatment. About 2:53 p.m., the incident commander requested Enbridge shut off gas service to the immediate area. Enbridge crews responded and isolated (stopped) the gas flow to the affected area by 3:33 p.m.

The incident commander requested personnel from the electric utility First Energy–Ohio Edison (Ohio Edison) to shut off power to the Realty Building about 3:06 p.m.[11] About 4:19 p.m., the incident commander paused search and rescue operations because water was filling the Realty Building basement from a water main that had broken in the explosion, and electricity in the building was still on. Ohio Edison records indicate that crews had been dispatched about 3:17 p.m. but left when they were unable to gain access to the accident scene. Ohio Edison personnel returned to the scene and shut off power about 6:25 p.m., and search and rescue operations resumed.

1.3 Postaccident Tests and Evaluations

After the accident, on May 28, Enbridge conducted an initial pressure test of the main and service line to the Realty Building. The pipeline failed to hold pressure, and crews heard a hissing noise from the pipeline in the basement that the scrap-removal crewmember had cut into just before the accident.

NTSB evaluations indicated that the accident service line was still connected to the main, and the curb valve to the accident service line was in the open position, allowing gas to flow from the main into the service line.[12] As part of Enbridge's response to the design locate request, they located the main and active service lines to the

[11] Between 3:15 and 5:15 p.m., emergency response personnel made several calls to Ohio Edison to shut off power.

[12] A *curb valve* is a manually operated valve located on the service line near its connection to the gas main.

building and marked the ground above the lines in yellow paint. There were no yellow paint markings outside or inside the building indicating that the accident service line was pressurized with gas.

1.4 Procedures

1.4.1 Enbridge

Enbridge procedures at the time of the recorded accident service line abandonment (and at the time of the accident) required that when abandoning a pipeline, all pipeline facilities must be disconnected from all sources and supplies of gas, purged of gas, and sealed at both ends.[13] Procedures specifically for service lines required curb valves to be removed or closed and service lines to be disconnected as close to the main as possible.

1.4.2 Chase Bank

The Chase Bank employees had previously received training on emergency procedures, which at the time of the accident required immediate evacuation in the event of smoke, fire, or the activation of the business's fire alarm system. The procedures did not require immediate evacuation upon the report of a natural gas leak, stating instead that employees may evaluate their level of safety and determine the timing of their evacuation from the building accordingly for conditions that did not include smoke, fire, or alarm activation.

2 Analysis

2.1 Accident Summary

Natural gas was released into the basement of the Realty Building and caused an explosion in Youngstown, Ohio, after a member of a scrap removal crew cut into a steel pipeline. Although the cut pipeline had not been marked or otherwise identified as containing natural gas, it did contain gas, pressurized at about 38 psig, which released into the building and fueled the explosion.

2.2 Inaccurate Records

The NTSB reviewed work order records related to the accident service line and noted these records were inaccurate. Enbridge's work order records from 2015

[13] (a) Enbridge used many Dominion procedures after the 2024 acquisition. (b) *Pipeline facilities* refer to pipes, fittings, and other components of a pipeline system.

indicated the curb valve had been closed, but NTSB investigators found the valve in the open position after the accident. Further, although the 2015 records indicated the accident service line had been disconnected from the main, the gas flowing through the pipeline after the scrap-removal crew member cut into it, as well as a postaccident pressure test, indicated that the service line was still connected to the gas system and contained natural gas. Enbridge's procedures regarding service line abandonment required curb valves to be removed or closed and service lines to be disconnected as close to the main as possible. The procedure did not include a requirement for the work crew to visually confirm the service line was disconnected from the main before processing the service line cut order.

The City of Youngstown submitted a design locate request to Ohio's 811 center in January 2024, so Enbridge was aware of the project; further, twice before the accident (in January and again in May) a contractor for the natural gas distribution operator had located both the main and the active service line and had marked their path on the ground above them with yellow paint. Ohio 811 uses mapping data from its members (gas companies and other utility owners) to notify them of upcoming work so that the utility owners can locate and mark underground assets. Natural gas system maps at the time of the city's locate request to Ohio 811 did not include information about the accident service line, so the Enbridge crew sent to mark the gas lines was unaware of and thus did not mark the accident service line. Although GreenHeart did not directly verify with Enbridge whether the accident service line was transporting gas before cutting into it, had they done so, the inaccurate records and lack of any visual indication that the line was active may have hampered Enbridge using their standard procedures from discovering that the service line still contained gas under pressure and therefore from providing a valid assessment of the pipe's status.

2.3 Emergency Procedures

Chase Bank's emergency procedures required immediate evacuation for certain situations such as smoke, fire, or an activated fire alarm. The procedures did not require immediate evacuation for a natural gas leak and assigned less urgency to such a situation, allowing employees to personally evaluate whether to evacuate immediately. Video footage showed that, although one Chase Bank employee evacuated the building after being notified of the gas leak about 2:42 p.m., other Chase Bank employees remained inside the Realty Building for about 2 minutes. Consequently, seven employees were still inside the building when it exploded about 2:44 p.m., one of whom was killed. Chase Bank's emergency procedures did not adequately inform employees of the extreme hazard associated with a natural gas leak and the need for immediate evacuation. Had the bank employees evacuated immediately upon being alerted of the gas leak, they may have escaped injury.

The incident commander requested Ohio Edison to dispatch personnel to the scene of the accident to shut off power about 3:06 p.m., but the personnel were unable to gain access to the area and left. Search and rescue operations were suspended from

about 4:19 p.m. until Ohio Edison crews returned and shut off the power about 6:25 p.m. The delay of more than 2 hours might have been avoided with better communication among Ohio Edison crews and external incident commanders.

3 Probable Cause

The National Transportation Safety Board determines that the probable cause of the explosion and subsequent fatality was a cut by a scrap-removal crew into an active Enbridge Inc. service line, which was incorrectly documented as having been abandoned years earlier by the pipeline owner at the time, Dominion Energy Inc., and which allowed natural gas to leak into the Realty Building where it was ignited by an unknown source. Contributing to the severity of the accident were Chase Bank's emergency procedures that did not require employees to immediately evacuate upon being alerted to a natural gas leak.

4 Lessons Learned

Natural gas pipeline operators must accurately document their pipeline abandonment and deactivation activities to prevent pipeline damage and accidental releases similar to this accident. In 2017, the NTSB also investigated a fatal home explosion in Firestone, Colorado, that resulted from natural gas migrating from an improperly abandoned underground facility into the basement of a residence, further underscoring the importance of proper pipeline abandonment.[14]

After the accident in Youngstown, the Public Utilities Commission of Ohio oversaw Enbridge's excavation of 10 service lines that were documented as abandoned around the same time as the accident service line. Enbridge found that two of these service lines were still pressurized with gas. Enbridge also reported after the accident that it was investigating 5,951 other pipelines that were documented as abandoned but whose records contained inconsistent or unconfirmed data. The company found that 79 of these pipelines were active. Enbridge subsequently properly abandoned them according to the new procedure and updated their corresponding records.

In August 2024, Enbridge issued a pipeline safety alert advising crews about a revised practice for disconnecting and abandoning service lines. According to the revised practice, before completing a service line cut order, the pipeline must be exposed for visual confirmation that the service line has been effectively cut from the main and capped off. Training materials have been updated to reinforce the revised practice. Enbridge also is installing warning tags on their interior piping assets to alert customers of the presence of pressurized gas and how to contact the gas company.

[14] NTSB. 2019. *Natural Gas Explosion at Family Residence, Firestone, Colorado, April 17, 2017*. PAB-19/02. Washington, DC: NTSB.

After the accident, Chase Bank revised its emergency guidelines and employee training to require immediate evacuation during incidents involving gas leaks.

Ohio Edison revised training courses for employees on its emergency processes to reiterate the importance of coordinating and communicating with external incident commanders during all incidents, including those in which no specific work order has been given, to facilitate timely response in emergency situations and reduce delays.

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For more detailed background information on this report, visit the NTSB Case Analysis and Reporting Online (CAROL) website and search for NTSB accident ID PLD24MR005. Recent publications are available in their entirety on the NTSB website. Other information about available publications also may be obtained from the website or by contacting—

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