Gas Pipeline Blast Zones

Knowing the Risks & Emergency Planning

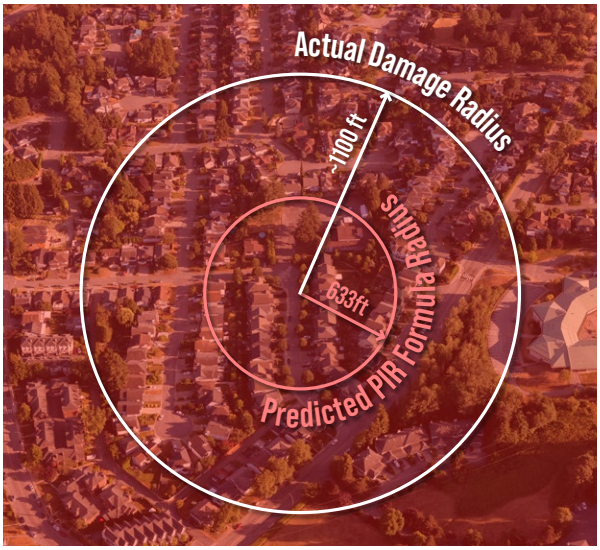
What Is a Blast Zone?

Gas pipelines operate under high pressure, and when a rupture or explosion occurs, it can have catastrophic consequences. The area most at risk is known as the blast zone, or more technically, the Potential Impact Radius (PIR).

This PIR is calculated using a standard formula developed by GTI Energy, a research group affiliated with the gas industry. **The formula estimates how far the effects of a rupture, such as heat, fire, and shock, might spread, based on factors like pipeline size and pressure.** [1]

Explosion Risk

In a 2019 explosion in Danville, Kentucky, caused by a rupture in a natural gas transmission pipeline, the predicted PIR was 633 feet. **However, the blast damaged homes up to 1,100 feet away, and the fatality occurred outside the calculated zone.** [2]



The National Transportation Safety Board (NTSB) has formally recommended revising the PIR formula because it does not account for real-world impacts. Despite this, the Pipeline and Hazardous Materials Safety Administration (PHMSA) has not yet acted on that recommendation. [3]

The PIR model assumes that in the event of an explosion, a person could detect danger, begin moving within 1 to 5 seconds, and run at 5 mph to shelter 200 feet away, all within 30 seconds.[1] **That timeline does not account for children, older adults, people with disabilities, anyone who may be or affected by other factors**.

Transco's Safety Record

The operator behind the Southeast Supply Enhancement Project (SSEP), **Transco, has a higher rate of incidents, fatalities, and gas releases than most major pipeline systems in the U.S.**, according to an analysis by the Pipeline Safety Trust. [4]

Emergency Response

Federal regulations require pipeline operators to assess risks to nearby communities and coordinate with local emergency services. However, after pipeline accidents, **it is common for local first responders to report they were unaware of pipelines in their jurisdiction or had no training on how to respond.** [5]

Incident Frequency

According to a review by FracTracker[6], from 2010 to 2023:

- **A fire occurred every 4.2 days**
- **An explosion occurred every 12.2 days**
- **Someone was killed every 29 days**
- **Someone was injured every 6.5 days** [7]

Questions You Can Ask

- How close is my home to a high-pressure transmission line or compressor station?
- Has my town or county EMS been trained or equipped to respond to a pipeline explosion?
- What emergency alert systems or evacuation plans are in place?
- Does the pipeline operator provide detailed risk data and response plans to the public?

What You Can Do

- Visit NOSSEP.org to learn more about pipeline safety, community protections, and opportunities to make your voice heard.
- Ask your local officials whether emergency services are trained to handle pipeline explosions.
- Talk to your neighbors and local schools about what's at stake and how to prepare

Sources

1: Stephens, Mark. The Potential Impact Radius Formula: Background to Development and Validation, PHMSA/GTI, Dec. 14, 2022. https://primis-meetings.phmsa.dot.gov/archive/Day_2_AM_815_Gas_PIR_Development_Backg round.pdf

2: National Transportation Safety Board. Enbridge Pipeline Rupture and Fire – Danville, KY, PIR-22/02, 2022. https://www.ntsb.gov/investigations/AccidentReports/Reports/PIR22002.pdf

3: NTSB Safety Recommendation P-22-001. https://data.ntsb.gov/carol-main-public/sr-details/P-22-001

4: Pipeline Safety Trust. Public Comment to FERC on SSEP, Docket No. PF24-2-000, 2024. https://pstrust.org/comment-to-ferc-on-environmental-scoping-for-transco-southeast-supply-enh ancement-project-docket-no-pf24-2-000/

5: Pipeline Safety Trust. Briefing Paper on Emergency Planning, 2024. https://pstrust.org/wp-content/uploads/2024/09/13-PST-BriefingPaper-EmergencyPlans.pdf

6: 2022 Pipeline Incidents Update: Is Pipeline Safety Achievable? FracTracker, 2023.

7: Robbins, Shelley. A Pipeline of Problems, Southern Alliance for Clean Energy, 2024. https://drive.google.com/file/d/1rb7W9dg2gQ9vvE3F5WMD3V2q8zmlovgp/view