

Gas Pipeline Blast Zones: Knowing the Risks & Emergency Planning

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What is the blast zone?

- The “blast zone” is also referred to as a gas pipeline’s “potential impact radius” (PIR), “incineration zone,” and “hazard area.”
- The blast zone predicts the area that would be significantly impacted if a gas pipeline explodes, and is determined through a formula/calculation created by scientists hired by the industry-affiliated group GTI Energy.¹
- The calculation relies on a number of assumptions that are held constant across scenarios. The resulting number is the size, in feet, of the “potential impact radius.”

What does it mean to be in the blast zone?

- In the event of an explosion, it is estimated that those within the potential impact radius or “blast zone” have only 30 seconds to flee and find shelter outside of the radius for the best chance of survival. The 30-second exposure time adopted is based on the unrealistic premise that an exposed person would stay in place for 1 to 5 seconds to evaluate the situation and then be able to run at the speed of 5 miles per hour to some type of shelter within approximately 200 feet of their initial position.²
- These assumptions are not reasonable for whole groups of people - such as young children or anyone who has mobility or other limitations or even anyone who is asleep at the time of the explosion! Yet everyone deserves to be included in safety considerations.
- The National Transportation Safety Board (NTSB) found the formula is not consistent with real world evidence, concluding that, “high consequence areas determined using the equation do not include the full area at risk.”³ The NTSB has also recommended that PHMSA revise the PIR methodology.⁴

Blast zone risks & Transco’s poor safety record

- In 2022, the NTSB released a Pipeline Investigation Report of the 2019 Enbridge natural gas transmission pipeline rupture and fire in Danville, KY that killed one, injured six, and caused extensive property damage. The NTSB found that, while the PIR at the rupture site was calculated at 633 feet, physical evidence at the accident site found damage to homes up to 1,100 feet from the rupture crater. The woman who was killed by the rupture was found at 640 feet, which was beyond the calculated PIR.
- NTSB’s report also documents the history of problems with the current PIR formula going back to 2000: the 2000 Carlsbad, NM incident that killed 12 people, the 2010 San Bruno, CA incident that killed 8 and injured 58, and the 2012 Sissionville, WV explosion that destroyed three homes and caused extensive environmental damage. This report called into question the PIR calculation method and recommended that PHMSA revise the calculation methodology for PIRs⁵, which it still has not done.⁶
- Industry watchdog Pipeline Safety Trust analyzed publicly available records and found that the Transco system has more safety incidents than most pipelines. Even when adjusting for the length of Transco, Williams Co. is worse than other gas transmission operators in fatalities, cost per incident, and releases per incident. Further, most of the causes of Transco’s incidents are what PST considers to be “direct,” meaning the operator could have prevented the incident.⁷

¹ Mark Stephens, The Potential Impact Radius Formula, Background to Development and Validation, page 2 (Dec. 14, 2022)

https://primis-meetings.phmsa.dot.gov/archive/Day_2_AM_815_Gas_PIR_Development_Background.pdf

² Mark Stephens, The Potential Impact Radius Formula, Background to Development and Validation, page 10 (Dec. 14, 2022)

https://primis-meetings.phmsa.dot.gov/archive/Day_2_AM_815_Gas_PIR_Development_Background.pdf

³<https://www.nts.gov/investigations/AccidentReports/Reports/PIR22002.pdf>

⁴ National Transportation Safety Board, Enbridge Inc. Natural Gas Transmission Pipeline Rupture and Fire PIR-22/02 (Aug. 1, 2019) [Exhibit 1].

⁵ National Transportation Safety Board, Enbridge Inc. Natural Gas Transmission Pipeline Rupture and Fire PIR-22/02 (Aug. 1, 2019) [Exhibit 1].

⁶ National Transportation Safety Board, Safety Recommendation P-22-001 <https://data.nts.gov/carol-mainpublic/sr-details/P-22-001> [Exhibit 2].

⁷ pstrust.org/comment-to-ferc-on-environmental-scoping-for-transco-southeast-supply-enhancement-project-docket-no-pf24-2-000/

- According to a FracTracker analysis of oil and gas pipeline incidents reported between 2010 and 2023, a fire erupts every 4.2 days, an explosion occurs every 12.2 days, a person is killed in one of these incidents every 29 days, and an injury is reported every 6.5 days⁸
- Another type of consequence that is rarely considered when talking about pipeline incidents is health-related. Some individuals experience mental and/or physical health effects after an incident. These types of health effects are not captured in the incident data and rarely are reflected in the incident reports.

What about safety measures and first response plans?

- Regulatory rules are supposed to require companies to use the potential impact radius to determine if the area around their pipelines is densely populated enough to require extra safety measures, such as using thicker-walled pipe, testing the pipeline at higher pressures, or operating the pipeline at lower pressures.⁹
- The regulations are clear that pipeline operators are supposed to be well prepared to respond to emergencies. It is also clear that they are supposed to have prepared local emergency response agencies to respond as well. Unfortunately, it is common after incidents to hear local emergency responders report they had no knowledge of a pipeline within their jurisdiction.
- It's important that project developers/operators introducing risks into communities are held accountable to equip and liaison with emergency response agencies to ensure they are ready if an incident occurs. This includes providing the necessary information and regular training as well as adequate equipment.

What can communities do?

- Reach out to elected officials, such as town council and county commissioners, especially those involved in emergency response planning, to express your concerns and ask questions (suggestions below)
- Learn more at nossep.org + follow & share the “No SSEP” pages on Facebook and Instagram

Concerns to express

- I am worried that Transco SSEP's estimated blast zone does not take into account the risks found at real world explosions.
- I am worried that Transco SSEP's estimated blast zone does not account for the fact that there are an additional 3 or 4 pipelines at points in the right-of-way.
- I am concerned that our local emergency responders don't have the training or equipment they would need in case of an explosion.
- I am concerned that our community members living, working or attending school within SSEP's blast zone may be unaware of the dangers and protocols for evacuation in the event of an explosion.

Questions to be asking

- What are the dangers and potential consequences of multiple high-pressure pipelines adjacent to each other?
- What about construction-induced incidents? What could happen if an existing pipe were damaged during installation of a new pipe?
- How will emergencies be handled and by whom? Is the town/county EMS equipped currently to handle this? If not, who will be responsible for investing in proper equipment and training? How would people be notified in the event of an incident? What are reporting requirements, evacuation times, etc.
- Will SSEP odorize the gas running through it, so leaking gas can be detected by smell? How will leaks be monitored?
- What is Transco's integrity management plan to identify, prioritize, assess, evaluate, repair and validate, through comprehensive analyses, the integrity of their pipelines over time? Is this available to the public?

⁸ A Pipeline Of Problems, Shelley Robbins, Southern Alliance for Clean Energy

⁹ pstrust.org/wp-content/uploads/2024/09/13-PST-BriefingPaper-EmergencyPlans.pdf

Additional references:

- Pipeline Safety Trust Briefing Papers: pstrust.org/wp-content/uploads/2024/09/13-PST-BriefingPaper-EmergencyPlans.pdf
- Pipeline Safety Trust Guide to Scoping Comments: [Public-Guide-to-PST-Scoping-Comment-SSEP-July-2024-footer.pdf](#)