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Enbridge Commits Multiple Safety Violations in 2019 Pipeline Explosion that Killed One

In addition to one fatality, the incident caused six injuries and the evacuation of 75 people

BELLINGHAM, Washington [Sept. 16, 2022] – The National Transportation Safety Board (NTSB) has released their investigation into Enbridge Inc.'s August 1, 2019 pipeline rupture in Danville, Kentucky. The rupture caused a more than 30-foot section of the Texas Eastern Transmission (TET) pipeline to eject and crash-land over 480 feet from the rupture site, while simultaneously releasing 101.5 million cubic feet of natural gas that ignited into a massive fireball. The blast and ensuing destruction killed one individual, injured six others, destroyed five homes, and damaged 14 other residences. The NTSB's investigation report paints a clear picture; this tragedy could have been avoided. This report alarmingly echoes the NTSB report on Enbridge's oil spill in Marshall, Michigan in 2010, calling into question pipeline safety progress since that devastating failure.

Safety issues identified in the NTSB report range from missed training opportunities for Enbridge employees to erroneous calculations made when determining the TET pipeline's potential impact radius (PIR). According to US Department of Transportation's Pipeline and Hazardous Materials Safety Administration (PHMSA), a potential impact radius is defined as the radius of a circle within which the potential failure of a pipeline could have significant impact on people or property.

NTSB also found a manufacturing defect known as a hard spot, degraded pipe coating, and faulty cathodic protection applied after a 2014 gas flow reversal project which all led to hydrogen-induced cracking at the pipeline's outer surface and its eventual rupture.

The TET pipeline's fracture originated at the hard spot. The pipeline was 61 years old at the time of the rupture. Hard spots are more prevalent in pipelines of older vintage.

Enbridge knowingly underestimated the threat of hard spots on their TET pipeline, and their procedures for dealing with hard spot threat interaction were both contrary and illogical when compared to prior industry knowledge and PHMSA recommendations.

“Both the 2012 NTSB report on the Enbridge failure in Marshall, MI and the new report point out that Enbridge knew about defects and anomalies on the pipeline for years and failed to properly mitigate them,” Pipeline Safety Trust Executive Director Bill Caram said. “We know that the rate of pipeline failures increases once pipelines are as old as this failed Enbridge segment, but operators tell the public that developments in technology such as in-line inspection tools keep them safe. Incidents such as this tragedy prove that to be false.”

When the TET pipeline ruptured at 1:23 a.m. on August 1, 2019, Enbridge employees scrambled to isolate the line and prevent further damage. According to the NTSB, an on-duty station operator was present, saw the fireball from the compressor station, and also read a low-pressure alarm warning, still, he did not close the manual valve at his station until instructed by his area supervisor. The NTSB notes in their report that proper training could have made the employees’ response more effective and timelier. Because this section of the TET pipeline is not equipped with automatic or remote shut-off valves, Enbridge employees had to manually close valves to isolate the line, which took nearly an hour to complete. The on-duty station operator closed his valve 16 minutes after the rupture. A second employee directed to turn off the valve on the north side of the rupture didn’t close theirs until nearly an hour after the incident.

“Remote control or automatic shut off valves would have reduced the damage from this failure, but PHMSA does not require them,” Caram said. “Even PHMSA’s new valve rule, in response to the PG&E pipeline tragedy in San Bruno, CA, will only require them on new and fully replaced pipelines, leaving older pipelines with higher rates of failure, such as TET, to continue operating with manual valves.”

According to federal pipeline safety regulations, operators must use a pipeline’s Potential Impact Radius (PIR) to determine if that pipeline is located in a high consequence area (HCA). According to PHMSA, HCAs are certain locales and areas where a pipeline release could have the most significant adverse consequences.

In their investigation, NTSB concludes that PHMSA’s current PIR equation does not function as intended and is inconsistent with findings from previous natural gas pipeline incidents. For example, the PIR calculated at the Danville, KY rupture site was listed at 633 feet, but evidence collected following the aftermath of the incident showed that the path of destruction reached homes up to 1,100 feet away.

“I hope to see PHMSA address this shortcoming in their regulations by adopting a nonconservative calculation for potential impact areas from pipeline failures,” Caram said. “In the meantime, there is nothing to prevent operators from reassessing their pipelines with knowledge of this shortcoming in order to prevent further tragedies.”

Gas transmission pipelines located in HCAs, such as this section of TET, are subject to integrity management regulations. Integrity management (IM) consists of a series of efforts focused on maintaining safe and functional pipelines; however, it is largely up to the operator on how they identify and mitigate threats. The NTSB notes in their investigation that even though Enbridge did complete a few integrity management actions, there were several deficiencies.

“The NTSB report shines a light on the many shortcomings of the Integrity Management program and its implementation. Sadly, much of it seems eerily repeated from their 2012 Marshall, MI report,” Caram said. “Integrity Management places a lot of the onus on the operator to exhaustively identify threats to their system and appropriately mitigate them, but we continue to see operators falling short on their responsibilities to the public. Tragically in this case, Enbridge’s shortcomings killed someone and sent six others to the hospital,” he said.

Following the incident, and as a result of their investigation, the NTSB has made recommendations to both Enbridge and PHMSA on how they can avoid similar incidents in the future.

NTSB Recommendations to Enbridge:

- Enbridge must evaluate the effectiveness of its corrosion control equipment and infrastructure following a major change in operations, like a gas flow reversal;
- Enbridge must modify its integrity management program to better address threats and threat interactions; and require disqualification, remedial training, and/or requalification of covered tasks whenever an employee does not follow procedures when responding to an emergency shutdown, rupture, or other abnormal operation

NTSB Recommendations to PHMSA:

- PHMSA should revise regulations regarding potential impact radius calculations based on data from recent natural gas pipeline ruptures
- PHMSA should advise natural gas transmission operators on the circumstances of this accident, the need to evaluate the risks associated with flow reversal projects, the impacts of such projects on hydrogen-induced cracking, the possible data limitations associated with the use of in-line inspection tools and analysis used in hard spot management programs, and the need to follow industry best practices when conducting in-line inspection data analysis

The Pipeline Safety Trust hopes to see quick and complete incorporation of the excellent common-sense recommendations from the NTSB, which will undoubtedly keep our communities safer.

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