National Transportation Safety Board
Washington, D.C. 20594

Office of Railroad, Pipeline and Hazardous Materials Investigations

January 4, 2022

Investigator-in-Charge's Accident Summary

NTSB Accident #PLD20LR001
Natural Gas Pipeline Rupture and Fire
May 4, 2020, Hillsboro, Kentucky

On Monday, May 4, 2020 at about 4:36 p.m., an interstate natural gas transmission pipeline owned and operated by Enbridge Inc. (Enbridge) ruptured, resulting in a subsequent fire in a Class 1 location about 3 miles east-northeast of Hillsboro, Kentucky.[1] At the time of the rupture, the 30-inch diameter pipeline was operating at about 674 pounds per square inch gauge. The rupture occurred at a girth weld with no ejection of pipe. The fire burned vegetation over approximately 5 acres of heavily forested land. No injuries occurred as a result of this rupture and no structures were damaged. Enbridge estimated the cost of property damage and emergency response was $11,700,000.

At the time of the accident, the temperature was about 70 degrees Fahrenheit, and it was not raining. No significant seismic activity was recorded near that accident location in the week prior to the accident.

The rupture occurred on Texas Eastern Transmission Line 10 at a location that had been previously identified by Enbridge for geotechnical monitoring and mitigation due to an active landslide. Gas Control's initial notification of the rupture was from a member of the public at 4:40 p.m. Initial notification of the rupture to field personnel was also at 4:40 p.m. In the minutes that followed, the Owingsville Area Supervisor dispatched field personnel to begin isolating the affected segment. At 5:40 p.m., Gas Control confirmed that the ruptured segment was isolated.

Prior to the rupture, on July 19, 2019 and September 23, 2019, Enbridge's contractor issued strain reports which indicated peak movement of 4.2 feet and 5.2 feet, respectively.[2] Enbridge evaluated the failure location prior to the accident, through a site assessment (performed in October 2019) and a multidisciplinary review meeting on February 18, 2020.

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[1] (a) All times in this document are local time unless otherwise noted.
(b) Class locations are defined in Title 49 CFR 192.5 and range from one to four. Class location is defined based on the number and type of buildings within 220 yards of each side of the pipeline, with Class 1 locations representing the least populated areas, and Class 4 locations representing the most populated areas.

[2] The July 19, 2019 strain report was based on April 17, 2018 in-line inspection data. The September 23, 2019 strain report was based on June 7, 2019 in-line inspection data.

Enbridge's site assessment team estimated tensile strain capacity and tensile strain demand based on results from the June 7, 2019 ILI run and determined that urgent action was not required but monitoring and mitigation were recommended. The multidisciplinary team planned to install strain gages and drainage. According to Enbridge, they also planned to complete additional monitoring, mitigation, and future stress relief in the Summer of 2020.

Following the accident, two incomplete penetration and lack of root fusion defects were identified on the fracture surface of the failed girth weld.[3] One defect was about 7 inches in length and 0.130 inches in depth. The other defect was about 4.9 inches in length and 0.100 inches in depth.

[3] (a) *Incomplete penetration defects* occur when the weld root is not completely filled (both sides of the weld root are not fused).
(b) *Lack of root fusion defects* occur when the weld fails to fuse one side of the joint in the root.
(c) The *root* is the point at which the weld metal intersects the base metal and extends furthest into the weld joint.