

National Transportation Safety Board

Washington, DC 20594



Response to Petition for Reconsideration

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In accordance with Title 49 *Code of Federal Regulations* 845.32, the National Transportation Safety Board (NTSB) has reviewed the Petition for Reconsideration and modification of the probable cause of the UGI Utilities, Inc. (UGI) natural gas-fueled explosion in Millersville, Pennsylvania, on July 2, 2017 (Pipeline Accident Brief: PAB-19/01).¹ The petitioner has met the requirements for the NTSB's review of their petition; specifically, as a party to the investigation, Elster Perfection Corporation has a direct interest in the investigation and has claimed that the report has factual errors and that the NTSB's analysis of the accident is erroneous. Elster Perfection has offered their own analysis of the probable cause. Based on our review of the petition filed on October 3, 2019, the NTSB hereby grants the petition in part.

On July 2, 2017, at 12:32 p.m. local time, a natural gas-fueled explosion occurred at a single-family residence at 206 Springdale Lane, Millersville, Pennsylvania. The explosion killed one UGI technician and injured three others: another UGI technician, a UGI senior supervisor, and a Lancaster Area Sewer Authority employee. The explosion also destroyed the residence, and significantly damaged six neighboring homes, one of which was subsequently condemned.

At 10:26 a.m., a neighborhood resident walking in the area smelled natural gas and reported it to the local gas utility, UGI. About half an hour later, a UGI technician arrived to investigate and confirmed the gas leak. UGI placed an Emergency PA (Pennsylvania) One Call to mark the location of the sewer lines and a Lancaster Area Sewer Authority employee arrived on scene in

¹ Visit [nts.gov](https://www.nts.gov) to find additional information in the [public docket](#) for this NTSB investigation (case number DCA17FP006). Use the [CAROL Query](#) to search safety recommendations and investigations.

response. About 15 minutes before the explosion, the on-site UGI technician directed the resident of 206 Springdale Lane to evacuate. The resident left in their personal automobile. About 12:15 p.m., UGI requested fire department support. The first fire truck arrived at 12:28 p.m. and assumed a stand-by position. The residence at 206 Springdale Lane exploded at 12:32 p.m.

Following the accident, the natural gas main and service pipelines for the homes in the area of the explosion were leak tested. All segments held pressure except for the 206 Springdale Lane service line at the main; this pipeline segment had a Permalock mechanical tapping tee. Subsequent examination of the Permalock mechanical tapping tee revealed gas was leaking at the connection of the tee to the 2-inch main, and two of the four nylon bolts had fractured. At the time of the accident, the operating pressure of the line was 54 pounds per square inch, gauge (psig), as measured at the closest monitoring point, which was about 0.5 miles from 206 Springdale Lane.

As a result of our investigation, the NTSB determined that the probable cause of this accident was “an improperly installed mechanical tapping tee that leaked and allowed gas to migrate into the house where it ignited.”

Petitioner’s Claims

The petitioner, Elster Perfection, stated that factual information in the Pipeline Accident Brief (PAB) about the leak response timeline and the gas readings were incorrect. Further, Elster Perfection stated that the NTSB failed to properly analyze UGI’s response to the leak and requested that the NTSB revise the factual information in the report and re-analyze and revise the probable cause.

First, Elster Perfection requested that the timeline be corrected in both the PAB and the Pipeline Operations/Integrity Management Group Chairman’s Factual Report, and the corrected timeline be considered when determining the probable cause.

The petitioner stated that the timeline for the UGI response can be found in the senior supervisor’s interview where he stated that he did not arrive on scene any earlier than 12:14 p.m. The second team member did not arrive until 5 minutes later, and the third team member arrived after the explosion. Thus, Elster Perfection believes that the statement in the PAB that two of the three arrived shortly after 11:00 a.m. and the full crew assembled at 11:50 a.m. is inaccurate.

The second factual error suggested by the petitioner related to the gas readings, which the petitioner contends were inaccurate and placed the house at risk of explosion. According to the petitioner’s submission, the gas readings were inside

the house rather than on the stoop, as the PAB indicates. Further, the petitioner stated that the readings were percentage of gas-in-air rather than percentage of lower explosive limit (LEL) as indicated in the PAB.² Lastly, the petitioner contended that the evacuation was based on 10 percent to 11 percent gas-in-air rather than 20 percent LEL on the stoop as indicated.

Elster Perfection cited statements made by the UGI senior supervisor to support their points. Specifically, the senior supervisor stated that the UGI technician, who was subsequently killed in the explosion, told him he had 10 percent to 11 percent gas in the house, and that was why he was evacuating the homeowner from the house. The senior supervisor further clarified that the reading was for the volume of gas in the air, not the percentage of LEL. Further, the senior supervisor stated to NTSB investigators that the technician subsequently told him he had a gas reading of 21 on the stoop just before the explosion. The petitioner requested that both the PAB and the Pipeline Operations/Integrity Management Group Chairman's Factual Report be corrected.

Lastly, the petitioner asserted that UGI's leak response played a role in the accident and was not thoroughly analyzed in the report. According to the petitioner, the NTSB did not "analyze how the leak response led to the accident." The petitioner criticized the UGI response effort for failing to evacuate 206 Springdale Lane until about 1 hour after the declared leak, failing to contact the electric company to shut off electrical service until after the explosion, failing to check gas concentrations at 202 Springdale Lane in areas other than the basement, and failing to evacuate the residents of 202 Springdale Lane. Further, the petitioner questions the UGI senior supervisor's decision to squeeze off the gas main rather than closing a gas main valve. The petitioner further contends that had UGI employees closed the valve supplying gas to the cul-de-sac and shut off the electricity, the leak would have been remediated, and the explosion would not have occurred. Additionally, the petitioner states that the installation error cited in the PAB as the probable cause of the explosion might have been the probable cause of the leak, but it was not the probable cause of the explosion.

The petitioner also believes that UGI's "inadequate responses to gas leaks, its violations of Public Utilities Commission and federal regulations during the preceding years, and its settlements with the Public Utilities Commission in which it committed to enhancing its responses to natural gas leaks" should be listed as contributing causes.

² For natural gas, 20 percent LEL equates to 1 percent gas-in-air.

NTSB's Response

UGI's Gas Leak Response Time

Regarding Elster Perfection's contention that the gas leak response timeline described in the report is incorrect, we concur that it is and should be revised. The Survival Factors Group Chairman's Factual Report contains UGI's timeline of events, which documents that an emergency work order to investigate the gas odor report was generated by the UGI Call Center representative at 10:29 a.m. and a UGI technician arrived at the leak location about 11:00 a.m. The UGI technician called his senior supervisor about 11:18 a.m. and requested for additional crew to respond to the confirmed leak. About 11:50 a.m., the senior supervisor had identified two other UGI technicians, who were to travel to the leak site. The Survival Factors Group Chairman's Factual Report documents that the senior supervisor arrived on scene about 12:05 p.m. The second UGI technician arrived on scene about 12:19 p.m. The third UGI technician arrived about the time the explosion occurred, but not in time to assist with the response. We agree that the first full sentence on page 2 of the PAB, which states that "an additional UGI technician and a senior supervisor arrived shortly thereafter" is ambiguous. Therefore, this sentence will be deleted. The first sentence of the first full paragraph on page 3 of the PAB, which states that "about 11:20 a.m., the senior supervisor began assembling a crew to respond to the leak," is confusing. Consequently, this sentence will be edited to say, "about 11:20 a.m., the senior supervisor began looking for a crew to respond to the leak." Further, the last sentence of the first full paragraph on page 3 of the PAB, which states that "by 11:50 a.m., the senior supervisor had assembled a three-person crew at the site," will be edited to reflect that "by 11:50 a.m., the senior supervisor had identified a crew to respond at the site." We note that the second full paragraph on page 4 of the PAB contains additional information about UGI staff's arrival on scene. This information is correct. Therefore, no changes will be made.

Regarding the Pipeline Operations/Integrity Management Group Chairman's Factual Report, the last line of the first full paragraph on page 4 reads that "by approximately 11:50 a.m., the Senior Supervisor had assembled a 3-person crew that was responding to the site" (emphasis added). The UGI senior supervisor had, in fact, contacted and confirmed the three-member crew that would subsequently respond to the leak site. We do not believe that the factual report suggests the crew had arrived at the site by that time. Thus, no change will be made.

Gas Readings

Regarding Elster Perfection's second claim that the gas readings in the report are stated incorrectly and the reason given for the evacuation is incorrect, we concur.

However, we also note that there is some uncertainty about the gas readings in this explosion because the UGI technician who took the readings died in the explosion and was not available to testify on what readings he found at any particular time or place. This is documented in UGI's letter in response to this petition, dated January 2, 2020. Regardless of what the gas readings were, they were of a magnitude that compelled UGI staff to take immediate action. The on-site technician's initial measurements of the gas concentrations taken between 11:00 a.m. and 11:18 a.m. to confirm the presence of a gas leak were alarming enough to prompt UGI to immediately respond to the leak. In the next 56 minutes, the senior supervisor requested UGI dispatch to place a PA (Pennsylvania) One Call to mark the location of the sewer lines, informed other UGI technicians about the leak and requested their assistance, discussed plans to shut down the gas line with a UGI engineer, and instructed the on-site technician to evacuate the residence at 206 Springdale Lane by forcible entry, if necessary. The senior supervisor himself arrived at the scene about 12:05 p.m. and helped dig up the main gas line. About 12:14 p.m., he requested UGI dispatch to call 911 for emergency response and fire department support.

Based on this information, we agree that the third and fourth full paragraphs on page 4 of the PAB are unclear. We will, therefore, modify these two paragraphs to make it clear that the gas readings were such that UGI recognized there was a high risk of explosion and tried to mitigate the risk. The second sentence of the third paragraph, which states that, "while the excavation was underway, the technician reported that he was measuring 20 percent LEL at the stoop on 206 Springdale Lane and that he had trouble getting the occupant to respond to his knocking at the front door," and the second sentence of the fourth paragraph which states that, "based on the gas percentage reading of 20 percent LEL in the home, the technician decided to evacuate the home," are contradictory and inaccurate. Further, they cannot be verified because the UGI technician who took the readings died in the explosion. Therefore, these two sentences will be deleted and replaced with a sentence added after the first sentence of the fourth paragraph to clarify that "based on the gas concentration readings of 10 to 11 percent gas in air in the house, which would represent about 200 percent LEL concentration (well above UGI's 20 percent LEL threshold for resident evacuation), the technician decided to evacuate the house."

UGI's Role in the Cause of the Accident

The investigation documented a 56-minute interval between UGI's first confirmation of the leak and the time the senior supervisor requested the local fire department to respond. About 12:28 p.m., when the fire department arrived, the senior supervisor requested the fire chief to ventilate the home, but the fire

department did not have any available intrinsically safe fans. The gas explosion occurred about 12:32 p.m.

The Elster Perfection petition states that the cause of the accident was UGI's slow, understaffed, and uncoordinated response to the reported gas leak. We disagree and take no exception to the 56-minute time frame between the confirmed gas leak and the senior supervisor's request for fire department response. During this 56-minute time frame, the senior supervisor located available resources, traveled to the scene, took initial mitigative actions, and then called the fire department. Even if the supervisor had contacted the fire department earlier, they could not have helped because they did not have the tools necessary to mitigate the gas levels in the house.

Regarding Elster Perfection's argument that the explosion could have been prevented if UGI technicians had shut off the street valve rather than attempting to squeeze off the gas main, we find it speculative. Shutting off the street valve would have taken an undetermined amount of time to purge gas lines and subterranean void spaces and to sufficiently ventilate affected homes. The UGI senior supervisor told the NTSB that his decision to attempt to squeeze off the gas line near the leak source was motivated by his belief that he did not know how long it would take for the gas to dissipate, and he thought that squeezing off the main was the most expedient course of action.

Elster Perfection's petition asserted that had UGI requested the electricity to be shut off, the explosion would not have occurred. The NTSB disagrees with this statement. Although shutting off the electricity would have reduced the available ignition sources, it would not have eliminated them. Because the source of ignition was not identified, there is insufficient evidence to support Elster's argument. The petitioner criticized UGI for failing to evacuate 206 Springdale Lane until about 1 hour after the leak. The UGI technician had made several attempts to contact the resident of 206 Springdale Lane. He then followed UGI protocol and requested permission from his supervisor to forcibly enter 206 Springdale Lane. A few minutes after receiving permission, the resident of 206 Springdale Lane came to the door and was advised to evacuate. Elster Perfection's petition further criticized UGI for failing to check gas concentrations at 202 Springdale Lane in areas other than the basement and failing to evacuate the residents of 202 Springdale Lane. The NTSB believes that checking gas concentrations in areas other than the basement of 202 Springdale Lane would not have prevented the explosion. Furthermore, although the house was damaged and subsequently condemned, the residents of 202 Springdale Lane were not injured in the explosion.

The Elster Perfection petition also suggests that the factual errors in the PAB are significant enough to reassess whether the probable cause of the explosion was the initial leak or the failure of the utility to remediate it. We disagree, because the facts support that the improperly installed mechanical tapping tee allowed gas to migrate into the house, and this was the cause of the explosion, regardless of the source of ignition. Elster's petition does not dispute that the mechanical tapping tee was improperly installed or that it was leaking. The primary safety issue identified in this investigation is that no gas should have been leaking. Therefore, the PAB and associated safety recommendations are correctly directed at preventing future gas leak incidents caused by improper mechanical tapping tee installation. We do not believe Elster's petition provides a compelling argument that the UGI response was causal to the accident. The cause of the explosion was the gas leak from an improperly installed mechanical tapping tee.

Disposition

While Elster Perfection's petition identifies factual errors that will be corrected, it does not offer new evidence or a compelling argument that the NTSB's findings are erroneous. Thus, the petition does not alter our assessment of the elements in the statement of probable cause for this accident.

After review of the evidence, the Petition for Reconsideration and modification of the NTSB's report in connection with the UGI Utilities natural gas-fueled explosion in Millersville, Pennsylvania, on July 2, 2017 (DCA17FP006), is granted in part. The PAB has been modified as shown in the attachment.

[PAB-19/01 Corrected](#)

Chair HOMENDY and Members LANDSBERG, GRAHAM, and CHAPMAN concurred in the disposition of this Petition for Reconsideration.