



National Transportation Safety Board

Washington, D.C. 20594

Safety Recommendation

Date: JUN 08 2011

In reply refer to: P-11-1 and -2

The Honorable Cynthia L. Quarterman
Administrator
U.S. Department of Transportation
Pipeline and Hazardous Materials Safety Administration
East Building, 2nd Floor
1200 New Jersey Ave., SE
Washington, DC 20590

On September 9, 2010, about 6:11 p.m. Pacific daylight time,¹ a 30-inch-diameter underground natural gas transmission pipeline (which is identified by the company as Line 132), owned and operated by Pacific Gas and Electric Company (PG&E), ruptured in a residential area in San Bruno, California. The accident killed eight people, injured many more, and caused substantial property damage. The rupture on Line 132 occurred near mile point 39.28, at the intersection of Earl Avenue and Glenview Drive in San Bruno. About 47.6 million standard cubic feet of natural gas were released as a result of the rupture. The released natural gas was ignited after the rupture; the subsequent explosion created a crater about 72 feet long by 26 feet wide, and the resulting fire destroyed 38 homes and damaged 70. A ruptured pipe segment about 28 feet long was found about 100 feet away from the crater.

The safety recommendations in this letter address the importance of pipeline operators' communications with the local 911 emergency call center(s), both before and in the event of a pipeline rupture. Effective emergency preparedness plans need to include appropriately detailed and accurate maps of the pipelines located within the area of the accident. These local maps are a crucial component of the emergency response planning process and of the emergency response itself. In addition to the exact path of each pipeline, which is shown on the maps, other system-specific technical information for each pipeline, such as pipe diameter, operating pressure, product transported (by shipping name and 4-digit U.S. Department of Transportation Hazard Identification Code UN number²), depth (soil coverage), potential damage impact distance (potential impact radius, defined in Title 49 *Code of Federal Regulations* 192.903), and specific emergency contact

¹ All times mentioned in this letter refer to Pacific daylight time, unless otherwise specified.

² *Emergency Response Guidebook*, <<http://www.phmsa.dot.gov/hazmat/library/erg>>, collaboratively compiled by the U.S. Department of Transportation, Transport Canada, and the Secretariat of Transport and Communications of Mexico.

information (that is, telephone numbers), also is needed by emergency responders to plan and execute a timely and effective response to a pipeline emergency.

At the National Transportation Safety Board's (NTSB) public hearing³ on the accident, which was held March 1–3, 2011, in Washington, DC, testimony of the chief of the San Bruno Fire Department (SBFD) indicated that before the accident, the SBFD was aware of the PG&E gas distribution system, but it was neither aware of nor had information about the natural gas transmission line that ruptured in the accident. The SBFD had not accessed the National Pipeline Mapping System that displays the location of the nation's natural gas transmission and hazardous liquid pipelines. The chief also indicated that since the accident, the SBFD has made contact with PG&E and obtained maps showing the locations of PG&E natural gas transmission pipelines.

The PG&E program manager for safety, health, and claims testified that after the accident PG&E made maps of its natural gas transmission pipelines available to all of the communities and jurisdictions in which PG&E pipelines are located. When compared to distribution pipelines, transmission pipelines have different operating characteristics, such as pipeline diameter and operating pressures. Because of the differences in operating characteristics, transmission pipelines have different safety risks and concerns for the emergency response, including the pipeline company's ability to shut down the pipeline rapidly.

NTSB investigations in all transportation modes have shown that the most successful emergency responses occur when the responders are prepared through training, drills, and exercises and have readily available information to assess the event. Prior to the accident, PG&E's public awareness program for emergency responders did not include identification of pipeline locations. At the NTSB's public hearing, the SBFD fire chief testified, "The benefit of having knowledge of the location of the pipelines [is] because it gives the fire service the ability to pre-plan, to do scenario-based training."

The U.S. Department of Transportation has established regulations and programs aimed at providing information to responders (for example, pipeline markers, pipeline maps, railcar and truck placards). First responders can provide timely and valuable information to pipeline operators for the emergency response only when the responders know that a pipeline is involved and the name of the pipeline operator.

The NTSB is concerned that without system-specific information for natural gas transmission pipelines, as well as for hazardous liquid pipelines, local emergency responders are at risk and the effectiveness of the emergency response effort can be adversely affected. Therefore, the NTSB recommends that the Pipeline and Hazardous Material Safety Administration issue guidance to operators of natural gas transmission and distribution pipelines and hazardous liquid pipelines regarding the importance of sharing system-specific information, including pipe diameter, operating pressure, product transported, and potential impact radius,

³ The NTSB may hold a public hearing as part of its investigation into an accident to supplement the factual record of the investigation. The NTSB calls technical experts as witnesses to testify, and NTSB investigative staff and designated representatives from the parties to the investigation ask questions to obtain additional factual information. The hearing is not intended to analyze factual information for cause.

about their pipeline systems with the emergency response agencies of the communities and jurisdictions in which those pipelines are located.

The NTSB has learned in the course of the investigation that the Supervisory Control and Data Acquisition system alarmed within 4 minutes of the rupture, which alerted the operators of a possible line break by showing a significant pressure drop at the nearest downstream terminal and decreasing pressures on adjacent interconnected lines. Yet, call-in telephone notifications were made to the dispatch center, 7 minutes and 11 minutes after the rupture, by two off-duty employees and not the gas control center. The PG&E dispatch center responded to those calls, about 12 minutes after the rupture, by sending a gas service representative (a technician who responds to leaks and is not authorized to close a transmission pipeline valve) to the accident scene to confirm the information being relayed. The dispatch center told the gas control center about the fire and general location of the accident 16 minutes after the rupture. The gas control operators immediately made the connection between the alarms, pressure trends, and dispatch information. During this crucial period, no calls were made from the PG&E gas control or dispatch centers to emergency services to notify the fire department and first responders, who had arrived on scene within 3 minutes of a 911 call reporting the event.

A pipeline operator's prompt notification to the local emergency response agencies through a 911 emergency call center can be crucial to the success of the emergency response effort and protection of the public. Even in the case of a smaller, slower leak that does not immediately ignite, when the pipeline operator has immediately notified local emergency response authorities of the leak, the emergency responders are aware of a prospective serious problem, can mobilize the needed response resources and are better able to recognize quickly the symptoms of a potential serious gas leak threat.

PG&E procedures for handling emergency conditions reported by outside agencies and company personnel on high or low gas pressure events⁴ require a field employee to be dispatched to the gas incident location. This procedure requires the field employee to evaluate the danger to life and property, assess damage, and make or ensure that conditions are safe; the procedure also requires field personnel to notify a field service supervisor, a dispatcher, a gas maintenance and construction supervisor, or an on-call gas supervisor. Nowhere does the procedure instruct field personnel, the dispatch center, or the control center to contact emergency services through 911 or other means. The procedure does not discuss the involvement of city or emergency officials. Notifications that are outlined in the procedure are focused on company personnel and supervisors only.

PG&E emergency response procedures address leaks and ruptures as the same type of event, requiring a PG&E employee to assess the on-scene conditions in both types of events before taking emergency actions. This policy unnecessarily delays the response to a catastrophic rupture of a transmission pipeline. Had PG&E notified emergency responders of the suspected rupture, the first responders could have communicated to PG&E the catastrophic nature of the rupture. PG&E could have used this information to spur a more aggressive effort to isolate the rupture. Also, had PG&E communicated to emergency responders the magnitude of the fuel

⁴ High or low gas pressure events include breaks in gas transmission lines operating at 60 pounds per square inch, gauge, or greater.

supply and the estimated time required to isolate and stop the release, first responders could have used that information to plan evacuations, order resources to the scene, and design a response for the protection of life and property.

The NTSB is concerned that a pipeline operator that does not require control room operators to notify the applicable 911 emergency call center in the event of a possible pipeline rupture can adversely affect the timeliness and effectiveness of the emergency response effort. Therefore, the NTSB recommends that the Pipeline and Hazardous Materials Safety Administration issue guidance to operators of natural gas transmission and distribution pipelines and hazardous liquid pipelines regarding the importance of control room operators immediately and directly notifying the 911 emergency call center(s) for the communities and jurisdictions in which those pipelines are located when a possible rupture of any pipeline is indicated.

The National Transportation Safety Board makes the following safety recommendations to the Pipeline and Hazardous Materials Safety Administration:

Issue guidance to operators of natural gas transmission and distribution pipelines and hazardous liquid pipelines regarding the importance of sharing system-specific information, including pipe diameter, operating pressure, product transported, and potential impact radius, about their pipeline systems with the emergency response agencies of the communities and jurisdictions in which those pipelines are located. (P-11-1)

Issue guidance to operators of natural gas transmission and distribution pipelines and hazardous liquid pipelines regarding the importance of control room operators immediately and directly notifying the 911 emergency call center(s) for the communities and jurisdictions in which those pipelines are located when a possible rupture of any pipeline is indicated. (P-11-2)

NTSB investigators are still examining many issues related to the San Bruno pipeline rupture. At this time, the NTSB has not yet determined the probable cause of the accident. Nonetheless, the investigation has revealed the safety issues and recommendations described above, which should be addressed immediately. The NTSB would appreciate a response from you within 90 days addressing the actions you have taken or intend to take to implement our recommendations.

In response to the recommendations in this letter, please refer to Safety Recommendations P-11-1 and -2. If you would like to submit your response electronically rather than in hard copy, you may send it to the following e-mail address: correspondence@ntsb.gov. If your response includes attachments that exceed 5 megabytes, please e-mail us asking for instructions on how to use our secure mailbox procedures. To avoid confusion, please use only one method of submission (that is, do not submit both an electronic copy and a hard copy of the same response letter).

Chairman HERSMAN, Vice Chairman HART, and Members SUMWALT, ROSEKIND, and WEENER concurred in these recommendations.

A handwritten signature in black ink, appearing to read 'D. Hersman', with a long horizontal flourish extending to the right.

By: Deborah A.P. Hersman
Chairman