National Transportation Safety Board

Washington, D.C. 20594

Safety Recommendation

Date: JUN 25 2007

In reply refer to: P-07-7 through -9

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Administrator
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About 11:15 a.m. central daylight time on October 27, 2004, an 8-inch-diameter pipeline owned by Magellan Midstream Partners, L.P., (Magellan) and operated by Enterprise Products Operating L.P. (Enterprise) ruptured near Kingman, Kansas, and released approximately 4,858 barrels (204,000 gallons) of anhydrous ammonia.[1] Nobody was killed or injured due to the release. The anhydrous ammonia leaked into a creek and killed more than 25,000 fish including some from threatened species. Enterprise reported that the cost of the accident was $680,715, including $459,415 for environmental remediation.

The National Transportation Safety Board determined that the probable cause of the pipeline rupture near Kingman, Kansas, on October 27, 2004, was a pipe gouge created by heavy equipment damage to the pipeline during construction in 1973 or subsequent excavation activity at an unknown time that initiated metal fatigue cracking and led to the eventual rupture of the pipeline. Contributing to the severity of the accident was the pipeline controller's failure to accurately evaluate available operating data and initiate a timely shutdown of the pipeline.

Enterprise's procedures for reporting accidents did not contain guidelines on using available information and pipeline data to estimate the release or damages for telephonic reporting to government agencies. In the controller's phone conversation with Enterprise's accident reporting contractor,[2] the controller reported that a large quantity of anhydrous ammonia had been released and had formed an ammonia vapor cloud, but he stated that he did not know the amount of anhydrous ammonia that had been released. When the contractor responded that without an estimate of a specific quantity the National Response Center would enter a 1,000-barrel estimate in its incident report, the controller told the contractor that a 1,000-barrel estimate would be fine. Later, when the controller confirmed that the release quantity was

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[1] For additional information, see National Transportation Safety Board, *Anhydrous Ammonia Pipeline Rupture Near Kingman, Kansas, October 27, 2004*, Pipeline Accident Brief NTSB/PAB-07/02 (Washington, DC: NTSB, 2007).

[2] 3E Company was Enterprise's accident reporting contractor.

at least 20 gallons, which indicates that the Environmental Protection Agency's (EPA's) minimum reportable quantity was exceeded, there was no further discussion of what release volume would be reported. When asked for a damage estimate, the controller said that he had no idea, but he selected the less-than-$5,000 estimate range. In Enterprise's telephonic report to the National Response Center, the significantly smaller release amount of 20 gallons and property damage under $5,000 were reported. However, due to the volatility of anhydrous ammonia, loss of the product contained between the closed valves of the 11-mile pipeline segment containing the rupture could not have been prevented. In this case, the estimate given to the Pipeline and Hazardous Materials Safety Administration (PHMSA) inspector on October 28, which was 3,000 barrels of product released, would have been more reasonable.

The EPA did not immediately respond to the National Response Center report of the release on October 27 because the 20-gallon release volume reported was so small that it was not an immediate response priority for the EPA. After reviewing the report the next morning, however, the EPA called Enterprise to ask how a vapor cloud was associated with the reported 20-gallon release. At that time, Enterprise gave the EPA an updated release estimate of at least 2,000 barrels (84,000 gallons). The higher release estimate led the EPA to immediately send two on-scene coordinators to the accident site. If a more accurate release estimate had been initially reported, the EPA would likely have positioned personnel on scene a day earlier, on the day of the accident, to ensure that remediation actions were being conducted in an effective manner. The EPA personnel arrived at the accident site on October 28 about 5:00 p.m., and sparging[3] was initiated in Smoot's Creek about 9:00 p.m. to mitigate the detrimental effects of ammonia that was leaching into the stream.

The low release estimate resulted in a low damage estimate of less than $5,000 that was well below the value of the ammonia released, which was approximately $100,000. Federal regulations require telephonic notification when damages, including the value of lost product, exceed $50,000. Enterprise's reporting process failed to provide accurate estimates of the amount of product released or damages. Enterprise did not provide reasoned information on the magnitude of the accident because the company did not have guidelines for estimating the product volume or damage cost of a pipeline release. In addition, Enterprise did not have a policy addressing the assignment of responsibility for reviewing significant information developed during the emergency response or for deciding whether an additional report to the National Response Center would be needed during the emergency response. The Safety Board concludes that Enterprise's failure to provide a reasoned release estimate initially to the National Response Center or even a timely release estimate update resulted in a delayed response by Federal agencies charged with the responsibility of protecting the environment and the public.

Since the accident, Enterprise has developed a written release reporting procedure that includes a guideline for estimating a product release using available operating data and the characteristics of the pipeline. Specifically for anhydrous ammonia pipelines, if the release amount is not known from operating data, Enterprise will telephonically report a release as the quantity of product contained between the valves closed on either side of the leak. Had this reporting procedure been in effect for this accident, the quantity reported for the release would

[3] *Sparging* is the process of injecting compressed air into a waterway causing volatile pollutants such as ammonia to vaporize into the air.

have been at least 3,600 barrels (151,200 gallons) for the 11-mile segment of pipeline that was closed off to isolate the leak. The new procedure also contains a matrix to estimate damages based on the severity of the leak. Under the new procedure, damages from an accident of this magnitude would be estimated for the report at no less than $250,000. The procedure also details when and how designated Enterprise employees are to provide telephonic updates to government agencies, including the National Response Center.

The Federal safety regulations that address telephonic reporting of hazardous liquid pipeline accidents currently include requirements to provide information on injuries and fatalities, fire or explosion, estimated amount of property damage, pollution of water or adjoining shorelines, and any other significant facts known about the cause of the pipeline failure or the extent of the damage. The reporting criteria found at 49 *Code of Federal Regulations* (CFR) 195.52 (b)(6) require a pipeline operator, at the earliest practicable moment following discovery of a release, to provide telephonic notification of "all other significant facts known by the operator that are relevant to the cause of the failure or extent of the damages." However, the "significant facts" currently required do not specifically include an estimate of product released, nor is an additional notification required if updated information becomes known to the operator.

In a liquid pipeline accident near Chalk Point, Maryland, on April 7, 2000,[4] information known to the owner and operator about the estimated quantity of the fuel oil spill was not communicated to the National Response Center at the time the report was made on the day of the release. The release amount reported was 2,000 gallons, although the quantity unaccounted for from tank measurement information was known to be approximately 3,000 barrels (126,000 gallons). An updated report was not made to the National Response Center even after the company's engineering calculations later that day confirmed the release amount to be 3,089 barrels (129,738 gallons). The EPA on-scene coordinator was not advised of the revised spill estimate until the following day. Other Federal, State, and local responders who received notification from the National Response Center report were not informed of the significant size of the product release.

Following the investigation of the Chalk Point, Maryland, accident, the Safety Board issued the following safety recommendation to PHMSA:[5]

P-02-2

> Require pipeline owners and operators to provide follow-up telephone updates to the National Response Center when they discover that the information they initially reported contains significant errors or when they identify significant new information directly related to the reporting criteria.

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[4] National Transportation Safety Board, *Rupture of Piney Point Oil Pipeline and Release of Fuel Oil Near Chalk Point, Maryland, April 7, 2000*, Pipeline Accident Report NTSB/PAR-02/01 (Washington, DC: NTSB, 2002).

[5] In a U.S. Department of Transportation reorganization, the Research and Special Programs Administration (RSPA) ceased operations on February 20, 2005. RSPA's Office of Pipeline Safety programs moved to the new Pipeline and Hazardous Materials Safety Administration (PHMSA). All references to predecessor agencies are designated as PHMSA.

On August 30, 2002, PHMSA issued an advisory bulletin to pipeline owners and operators to ensure that their telephonic reporting of accidents to the National Response Center is prompt and accurate and that they fully communicate the extent of accident damages. The bulletin contained information and guidance for operators about prompt and accurate telephonic incident reports and updates. The advisory bulletin indicated that a change in magnitude of the estimated amount of product released or damages was a significant fact to be reported to the National Response Center. In the background of its advisory bulletin on telephonic reporting, PHMSA indicated that although it may be difficult to estimate the amount of product released, an estimate of the quantity is critical information that pipeline operators need to provide. Because this bulletin clarified the telephonic notification regulations at 49 CFR 195.52, the Safety Board classified Safety Recommendation P-02-2 "Closed—Acceptable Action" on December 2, 2002.

The telephonic reporting guidelines in the PHMSA bulletin were not mandatory for pipeline operators, and this accident shows that the bulletin did not have a permanent impact on pipeline operator reporting to the National Response Center. The Safety Board recognizes that a pipeline accident needs to be reported to the National Response Center by the pipeline operator as soon as possible to notify agencies that need to consider taking action to protect the public and the environment. However, the initial telephonic report needs to contain reasoned estimates of the release and damages based on the type of product released and information available to and gathered by the operator. Currently, an additional report to the National Response Center is not required by the pipeline safety regulations when the pipeline operator finds or develops significant information after the initial telephonic report is made. The Safety Board concludes that the PHMSA advisory bulletin has proven to be insufficient to ensure that initial reports have reasoned estimates or that additional reports are made when significant new information becomes available to the operator. Therefore, the Safety Board believes PHMSA should require in 49 CFR 195.52 that (1) a pipeline operator must have a procedure to calculate and provide a reasonable estimate of product released in the telephonic report to the National Response Center and (2) a pipeline operator must provide an additional report to the National Response Center if significant new information becomes available during the emergency response.

Regarding PHMSA's oversight of Enterprise's integrity management program, PHMSA's 2003 inspection of the integrity management program for the anhydrous ammonia pipeline revealed some deficiencies that were noted on PHMSA's Integrity Management Inspection Form and Inspection Summary Report. The integrity management regulations required that an operator's schedule for baseline assessment of pipeline segments be based on a list of risk factors that specifically included leak history. At the time of the accident, however, Enterprise's integrity management program for the anhydrous ammonia pipeline contained incomplete instructions for incorporating leak history. PHMSA did not note the incomplete instructions during its inspection, and Enterprise provided no documents showing that leak history was considered. Enterprise had not used the pipeline's leak history either in calculating the risk scores or in prioritizing the baseline assessment plan, but PHMSA did not identify this deficiency during the 2003 inspection of the integrity management program.

After the 2003 inspection, PHMSA prepared a Notice of Amendment that was sent to Enterprise on April 22, 2004. In it, PHMSA pointed out the omission of certain other risk factors and the need for more detail in Enterprise's documentation describing how risk factors were integrated into its decision-making process. Enterprise's response to the Notice of Amendment

included revised procedures that addressed the omitted risk factors that PHMSA had identified. However, the leak history factor was still not used in calculating relative risk scores, and there was no indication that leak history was used in Enterprise's decision-making for prioritizing baseline assessments in any other manner. In addition, after receiving the revised procedures required by the Notice of Amendment, PHMSA did not require Enterprise to revise the integrity management program's baseline assessment plan. Although PHMSA did a good job of identifying pipeline risk factors that had not been considered by Enterprise, it did not recognize that leak history also had not been considered. More important, however, when PHMSA issued the notice to Enterprise to incorporate all the appropriate risk factors, it failed to require Enterprise to update its pipeline assessment plan based on the additional factors. The Safety Board concludes that PHMSA's failure to follow up on these issues indicates that PHMSA needs to exercise more effective oversight to ensure that discrepancies in pipeline integrity management programs are corrected. The Safety Board believes that PHMSA should require an operator to revise its pipeline risk assessment plan whenever it has failed to consider one or more risk factors that can affect pipeline integrity.

The National Transportation Safety Board recommends that the Pipeline and Hazardous Materials Safety Administration:

> Require in 49 *Code of Federal Regulations* 195.52 that a pipeline operator must have a procedure to calculate and provide a reasonable initial estimate of released product in the telephonic report to the National Response Center. (P-07-7)
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> Require in 49 *Code of Federal Regulations* 195.52 that a pipeline operator must provide an additional telephonic report to the National Response Center if significant new information becomes available during the emergency response. (P-07-8)
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> Require an operator to revise its pipeline risk assessment plan whenever it has failed to consider one or more risk factors that can affect pipeline integrity. (P-07-9)

The Safety Board also issued a safety recommendation to Enterprise Products Operating L.P. In your response to the recommendations in this letter, please refer to Safety Recommendations P-07-7 through -9. If you need additional information, you may call (202) 314-6177.

Chairman ROSENKER, Vice Chairman SUMWALT, and Members HERSMAN, HIGGINS, and CHEALANDER concurred in these recommendations.

By: Mark V. Rosenker
Chairman