National Transportation Safety Board
Washington, D.C. 20594

Office of Railroad, Pipeline and Hazardous Materials Investigations

February 3, 2022

Investigator-in-Charge's Accident Summary

NTSB Accident #PLD21FR002
Natural Gas-Fueled Explosion During Routine Maintenance
June 28, 2021, Farmersville, Texas

On June 28, 2021, at about 3:35 p.m. central daylight time, natural gas ignited causing an explosion during routine maintenance activities involving the insertion of an in-line inspection tool (pig) into a launcher, near Farmersville, Texas (Figure 1).[1] The pig was ejected from the pipeline shortly after it had been inserted into the launcher, while employees were manually removing the insertion tool.[2] Before the insertion tool was completely removed, employees at the site heard a loud sound and one employee observed a flash near the open launcher door. Employees from Atmos Energy Corporation (Atmos), FESCO, Ltd. (FESCO), and Bobcat Contracting, L.L.C. (Bobcat) were onsite at the time of the accident performing work for Atmos. The explosion was directed toward four employees, injuring all of them, two fatally. Three other employees who were working nearby on the same project were not injured.

An Atmos employee called 9-1-1 immediately following the explosion. The Collin County assistant fire marshal was the first responder to arrive and assist the injured. When the assistant fire marshal arrived, he observed no fire. The Collin County Sheriff's Office took control of the site, provided aid to the victims, and documented the accident scene. The Collin County Sheriff's office called the Federal Bureau of Investigation to investigate for any criminal activity; none was found.

Prior to the explosion, the launcher contained natural gas at a pressure of about 628 pounds per square inch gauge (psig). A portable flare system was used to depressurize the launcher by opening a valve that allowed natural gas to vent from the launcher to the flare tip, where it was successfully ignited. As natural gas pressure in the launcher decreased and less natural gas flowed to the flare tip, the flame died down and extinguished.

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[1] (a) All times in this document are local time unless otherwise noted. (b) *In-line inspection tools*, commonly referred to as *pigs*, are used to clean pipelines, identify pipeline defects nondestructively, or complete related preparatory tasks (e.g., measuring clearances). (c) A *launcher* is the portion of the pipeline facility used to insert pigs into a pipeline.

[2] The *insertion tool* was a 16-foot long metal pole with a cup welded on the end that was used to push the pig into the launcher.

In the seven minutes prior to the explosion, the workers completed photographing the pig, opened the launcher door, loaded the pig into the launcher, and began removing the insertion tool. Once the launcher was depressurized and before the launcher door was opened, there was no mechanism to reduce the concentration of natural gas within the launcher; natural gas concentration was about 100%.[3] Air entered the launcher barrel and natural gas escaped after the launcher door was opened, reducing the concentration of natural gas within the launcher.

Although none of the workers smelled natural gas odorant that concerned them, post-explosion examination found that the mainline valve leaked and had damaged sealing surfaces.[4] This leak caused the concentration of natural gas between the pig and mainline valve to increase after the pig was inserted into the launcher. The only other valve that connected the Atmos owned and operated natural gas transmission system to the launcher performed as designed in post-explosion examinations.

At the time of the accident, light to heavy rain showers and a temperature of about 75°F were reported. No cloud-to-ground lightning strikes were recorded within 15 miles of the site.

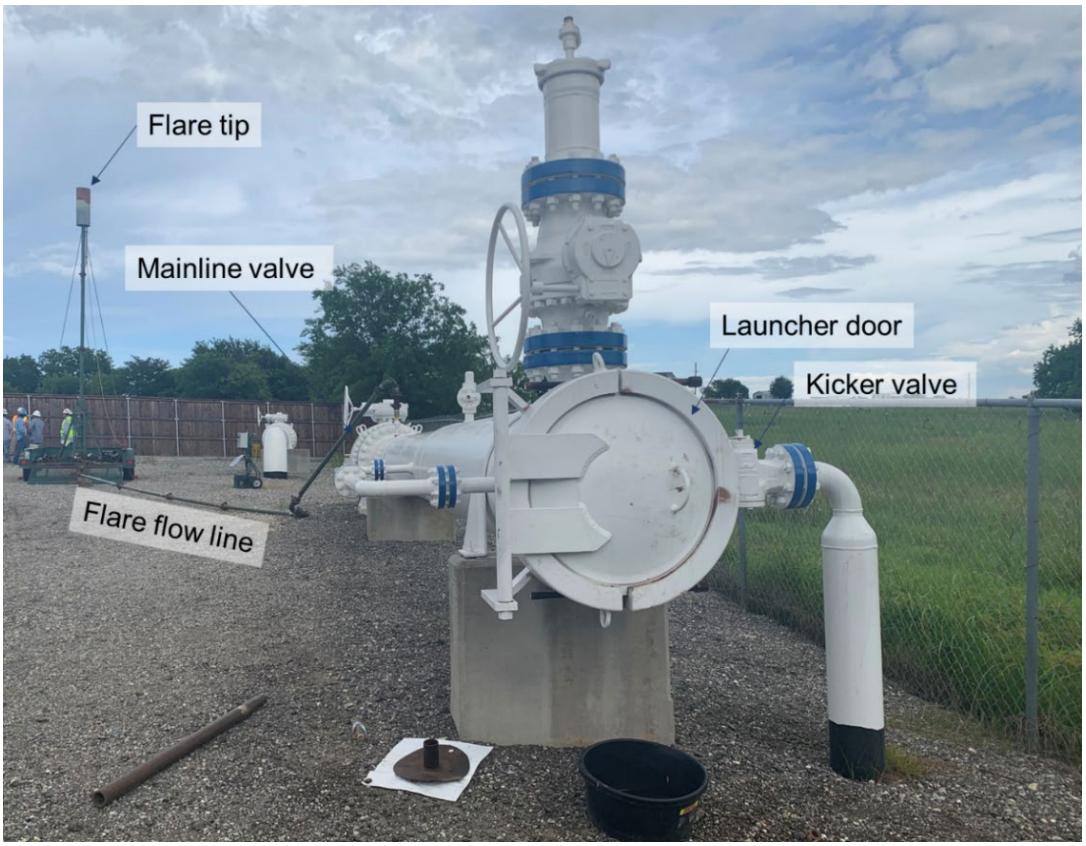

Figure 1. Front View of Pig Launcher Involved in the Accident

[3] (a) Natural gas has a flammability range of about 5-15% in air by volume. (b) The natural gas concentration was not measured directly.

[4] This type of damage is consistent with foreign debris entering the valve from an external source. The scratches were oriented perpendicular to the valve stem centerline, consistent with the direction of movement during normal operation. The valve was not operated immediately before or after the explosion.