LP-GAS INVESTIGATION REPORT

Accident Report ID # 13-LP-044

ACCIDENT SUBJECT: Property access permission granted by: Jimmy Williams, Montgomery County Fire Marshal

Name: Lena Mock Knight (Homeowner/ resident) Mailing Address 185 N. FM 1486

Dobbins (City) 77356 (Zip) Montgomery (County)

Geographic Location: 185 N. FM 1486, Dobbins, Texas

(GPS) N: 30.366980 W: 95.777265

INJURIES/FATALITIES: 1 No. of injuries 2 No. of fatalities (if more, add list)

Name: Lena Mock Knight Sex F Age 66 ☐ injured ☒ fatality

Name: Jennifer Jane Mock Sex F Age 58 ☐ injured ☒ fatality

Name: Wyatt Smith Sex M Age 8 months ☒ injured ☐ fatality

CONTAINER INFORMATION: (if more add list) CODE: X ASME ___ DOT TYPE X AG ___ UG

Nameplate information from principal tanks:

1) Mfg. Mosher Steel Co Ser. No. 110693 WP 250 WG 150 YR 1965

Distance from nearest building/structure/hwy: 28 feet from the house

Regulator: Rego Model No. LV 4403 Date Code 1996 Lock Up Setting 12 in. WC

Tank Damage None

Tank serviced by Triangle B Corporation Last date serviced 6/10/2013 Gallons 100

Approx. (%) fuel remaining: 43 Vapor pressure of product: 150 PSIG @ approx. 85°F

STATEMENT OF FACTS:

Synopsis

On Tuesday, June 11, 2013 at approximately 8:16 a.m. there was an explosion and fire at the residence of Ms. Lena Knight, 185 N. FM 1486 Dobbins Texas, Montgomery County. One infant and two women were in the house at the time of the incident. All three victims were transported by medical helicopter to the hospital in Galveston, Texas. Both women would later die from their injuries. The residence was totally destroyed from the explosion.

Assignment Data & Initial Contacts

On Tuesday 6/11/2013 at approximately 10:30 a.m. I received a call from Mr. James Osterhaus, Director of LP-Gas Operations, in the Commission's Austin office, informing me of the house explosion that had occurred earlier that morning.

Mr. Osterhaus gave me the contact number of Mr. Josh Griffith of the Montgomery Fire Department MCESD #2. I contacted Mr. Griffith by cell phone. Mr. Griffith gave me a brief overview of the incident and directions to the scene. Upon my arrival, I observed numerous people from various agences.

Mr. Darvis Willis, an inspector with Texas Railroad Commission, was also on site to assist me. I met with Mr. Jimmy Williams, the Montgomery County Fire Marshal, and several of his deputies. I was advised that Mr. Joe Manz, with the Montgomery County Fire Marshal's Office, would be the lead investigator

Description of Accident Scene

When I arrived on the scene, I found that the residence had been totally destroyed from the explosion. No interior or exterior walls remained standing. The majority of roof was blown away from the house and found on the North side of the house. Sections of the floor were all that remained of the structure. Debris was scattered in all directions as far away as 200 hundred feet from the house. There was also debris from

the house located in the trees adjacent to the house. There was some fire damage to two automobiles that were parked in front of the house. The house was a wood frame structure approximately 50' X 26'in size, built on a pier and beam foundation. It appeared the exterior wood siding on the house had extended to ground level, forming a skirting around the perimeter of the house. With the exception of an unvented type Dearborn space heater, there were no major appliances in the house at time of investigation. The appliances were found in the yard around the house.

LP-Gas Containers

A 150–gallon, aboveground ASME container, manufactured by Mosher Steel Company, serial number #110693 supplied propane to the house. The container was located approximately 28 feet from the rear of the residence. There was no visible damage to the container. The container had been serviced on June 10, 2013 by Triangle B Corporation. The propane delivery truck driver, Mr. Richard Haynie stated that he filled the container with 100 gallons of propane. He also stated that the container's liquid level (float) gauge indicated 0% gas in the container prior to filling it. Never the less, he stated that he did not consider the tank to be empty because he was not able to push the container's filler valve open with his finger.

LP-Gas System

The regulator attached to the vapor service valve of the container was a Rego LV4403 integral two stage regulator (photo #1, #15). Copper tubing was connected to the outlet of the regulator and ran down the side of the tank where it joined to 3/4 inch galvanized piping, a 3/4inch female union, a 3/4inch close nipple, and a 3/4 inch tee fitting. One outlet of the tee had a short pipe nipple and cap the other outlet connected to ¾ inch galvanized piping that entered the ground adjacent to the container (photo #3). After the ¾ inch galvanized metallic pipe entered the ground it joined to a 90° elbow fitting. A short pipe nipple joined to the outlet of the elbow fitting and connected to a tee pipe fitting. One opening in the tee was equipped with a short pipe nipple that joined to a 90° elbow fitting. A short pipe nipple on the outlet of the elbow fitting was threaded into a quarter turn ball valve that was in the closed position (# 51, #52, #53, #54) the outlet of this valve was capped. The other opening of the tee fitting was provided with a short pipe nipple that threaded into a 90° elbow fitting. The outlet of this elbow fitting was equipped with a pipe nipple rising upward and joined into a 90° elbow fitting. The outlet on this fitting was attached to a nipple threaded into a ¾ inch to 1 inch bell reducer. The bell reducer was connected to 1 inch steel pipe that ran underground to the rear of the house, where it connected to a tee fitting (photo #51, #52, #53, #54). One end of the tee fitting was equipped with a ¾ inch pipe riser that passed vertically upward through the floor of the house in the kitchen area (photo #11, #18, #32, #33, #35). This pipe riser was paper thin and broken approximately 4"- 6" from the point at which it was joined to the tee fitting at ground level (photo #12 #33, #35, #36). The riser terminated with a manual shutoff valve. The valve was found in the open position and had a corrugated appliance connector attached to it that was joined to the cook stove (photo # 9, #11, #32). The other end of the tee fitting, shown as S#1 in the pipe sketch, joined to copper tubing that ran aboveground, under the floor of the house for approximately 13 feet, where it connected to a tee fitting and several 90 degree elbows. From this point the piping branched off in three directions.

Section two, as shown in the piping sketch as S#2, was a 10 foot section of metallic pipe running northeast, under the house at an angle toward the right front of the residence. This pipe was broken where it joined to a 90° elbow fitting under the house (photo #20, #21, #23). A section of piping joined to the outlet side of this elbow fitting passed upward through the floor and terminated with a manual shutoff valve found in the open position (photo #24, #26). From the manual shut off valve there was a short section of 3/8 inch copper tubing that connected to the wall furnace (photo #26). The copper tubing was pulled out of the flare fitting that was threaded in to the furnace control valve (photo #31, #37). Section # 3 was a 6 foot section of metallic ½ pipe threaded into a 90° elbow with a section of metallic pipe up through the floor that terminated with a manual shutoff valve in the closed position. This section went in a north west direction toward Bedroom # 1. Section # 4 was a 13 foot section of copper tubing that went in a south east direction toward bedroom # 2. The copper tubing terminated with a flare nut threaded to a flare by male half union that was threaded into a metallic street ell that was threaded into a second street ell that was threaded into a metallic tee fitting that was in the vertical position (photo #22, #30, #43) The top opening of the tee had a section of metallic pipe that extended up through the floor and terminated with a manual shut off valve that was in the open position (photo #22, #30). Section # 5 was an 11 foot section of ½ inch metallic pipe that extended toward the south side of the house and was connected to the water heater. This section of pipe was broken at a 90° ell (photo #41, #42).The water heater was located adjacent to the south wall of the house. The water heater control valve, the yellow corrugated flex connector, manual shut off valve and the

section of piping that had been connected to the broken 90° ell were all in place. The manual shut off valve was in the open position (photo #13, #16, #45, #47).

LP-Gas Appliances

(1) The cook stove was a four burner single oven Kenmore free standing range with electronic ignition. There was heavy mechanical damage to the stove which had been blown out the back of the house. The manual shutoff valve located in the supply line up stream of the cook stove was found in the open position at the time of my investigation. A corrugated appliance connector was attached between the manual shutoff valve and the cock stove (photo #9, #11, #10, #25, #27, #28).

(2) A wall furnace was found in the debris on the north side of the house. The furnace had received heavy mechanical damage. I was not able to identify the manufacture of the furnace. The manual gas shut off valve on the metallic supply pipe was in the open position. A short section of copper tubing was attached to the outlet of this manual shutoff valve (photo #26).The copper tubing appliance connector was broken and appeared to have been pulled out of the control valve of the wall furnace (#26, #29, #31, #37).

(3) There was a gas Dearborn unvented type space heater located in the house. The manual shutoff valve on the piping supply this heater was in the open position (photo #30).

Post-Accident Activities

On Tuesday, June 11, 2013 after arriving on scene and meeting with the investigators from the fire marshal's office, it was determined that due to the heavy damage and unsafe conditions, and the need for additional man power and equipment, it would be best to secure the scene and wait until all interested parties could do a joint investigation in an effort not to compromise the scene for others. Mr. Manz and I went to Triangle B and took a recorded statement from Mr. John Smith owner and Mr. Richard Haynie the delivery truck driver who delivered the gas to the Mock home on June 10, 2013 (see transcript). Mr. Haynie stated that he did not think the tank was empty because he could not push the filler valve seat in with his finger. And that no one ever indicated to him that the tank was empty. He also stated that he checked for leaks behind the cook stove. Mr. Smith stated that he had replaced the regulator at the tank about five years ago and that he thought that he did a leak test at that time.

On Monday, June 24, 2013 investigators and attorneys representing family members, Triangle B Corporation, Montgomery county fire marshal's office and I all met at the scene and implemented a plan to remove the debris and structure floor so that the LP gas lines under the floor could be exposed and examined. A liquid sample of gas was taken from the residence tank by David Heldenbrand of Bison Engineering. Mr. Heldenbrand also conducted a flow test and lockup test on the Rego regulator. The Rego regulator locked up at 12 inches of water column. Mr. Heldenbrand attempted to conduct a leak test of the piping system, but due to the many breaks in the system was unable to do so. The vertical section of piping that had come up through the kitchen floor and connected to the Kenmore cook stove was noticeably corroded, thin and broken (photo #12). All piping and appliances were taken into custody by Mr. Heldenbrand so that they could be examined in a lab.

On Monday August 18, 2013 I met with Mr. Haynie and Mr. John Smith at Triangle B Office and had both review and sign the transcribed copy of their recorded statement that was taken on June 11, 2013 by Mr. Manz and me. I also asked both to look at the copy of service records of the Mock residence to verify that they were correct. The service records indicate that 40 feet of copper pipe was installed at the residence on September 11, 2008. On June 26, 2008 a new regulator was installed in the piping at the container. On June 21, 2010 the cut off valve on the container and the container filler valve were replaced. They also stated the 40 feet of copper piping installed on September 11, 2008 supplied the clothes dryer located in the garage. Mr. Smith stated that he did not remember if he did a pressure test after installing the copper pipe. He also stated that he did remember doing a leakage test after the cut off valve and filler valve were installed on the tank. Mr. Smith did not have any written records of a pressure test or leak test ever being performed at the residence. Mr. Haynie again stated that he checked the cut off valve behind the cook stove with a liquid soap solution back on June 10, 2013. It was also determined by both that the copper gas line under the house had been installed by them many years ago, and that the 40 feet of copper pipe that was installed on September 11, 2008 was installed to a clothes dryer located in the garage. On August 19, 2013, Mr. Manz and I returned to the house and looked for the copper gas line to the garage, but did not locate it. We dug the service line up from around the side of the tank and did locate a buried ¼ turn cut off valve that was plugged off (photo#51, #52, #53, #54).

FINDINGS:

1. On Tuesday, June 11, 2013 at approximately 8:16 am there was an explosion that resulted in total destructions of the residence.
2. There were three injuries at time of the explosion two of which later became fatalities.
3. On Monday June 10, 2013 the Mosher Steel Company LP gas container Serial number 110693 was serviced with 100 gallons of propane, by Triangle B Corporation.
4. Prior to filling the container the delivery truck driver from Triangle B Corporation, Mr.Haynie stated the container float gauge indicated 0%
5. Mr. Haynes stated that when he lit the cook stove the first time that he had to bleed the air out of the line in order to get the burner to light
6. On Tuesday, June 11, 2013 at approximately 8:16 am there was an explosion that resulted in total destructions of the residence.
7. There were three injuries at time of the explosion two of which later became fatalities.
8. Mr. Haynie stated that he checked the cook stove cut off valve for leaks with a soapy leak detection solution.
9. Triangle B corporation had no written documentation of a pressure test or leak test ever being conducted at the home.
10. Triangle B corporation holds a category E license for retail and wholesale dealer. License # 08311
11. Richard A. Haynie, delivery truck driver for Triangle B corp. is certified with the commission and holds a Delivery/ Service and Installation Certification.
12. Based on statements obtained from emergency response personal on the scene following the explosion, Ms. Knight stated that prior to the explosion her and her sister were discussing that they smelled gas inside the residence. For unknown reason the sister lit the stove.

CONCLUSION:

Based on observations at the scene, statements, interviews and pictures, there was a propane gas leak at the home. A probable source of ignition could have been the electric igniter on the cook stove that Ms. Mock was reported to have lit while she attempted to check the cook stove for the source of the leak. The exact source of the leak is undetermined at this time.

ENCLOSURES: ☒ photos ☒ statement(s) attached ☒ service history

☒ sketch of scene ☒ odorization statement ☐ other sketches

R. A. Haynie Date 10/17/13
Investigated by

James T. Osterhaus Date 10/17/13
Reviewed by