

MEMORANDUM

TO: Eric Banks
FROM: Dale W. Johansen *A.W.J.*
SUBJECT: STAFF ACCIDENT REPORT filing
Case No. GS-83-236
DATE: May 24, 1983

The above-referenced report is to be filed by May 27. Twenty copies are being printed at this time. The original report, the copies, and an affidavit will be forwarded to you for filing as soon as the printing is completed.

A copy of the report stamped "FILED" should be sent to each of the following:

1. George R. Melling
Claims Manager
The Gas Service Company
2460 Pershing Road
Kansas City, MO 64108
2. Office of Public Counsel
3. Myself

Thank you for your cooperation in this matter. If you have any questions, don't hesitate to contact me.

/ba

cc: Judy Fritsch (for case papers)

FILED
MAY 24 1983
PUBLIC SERVICE
COMMISSION



Missouri Public Service Commission

Area Code 314
751-3234

P.O. BOX 360
JEFFERSON CITY
MISSOURI 65102

May 26, 1983

Commissioners

JOHN C. SHAPLEIGH

Chairman

LEAH BROCK McCARTNEY

CHARLES J. FRAAS

LARRY W. DORITY

CHARLOTTE MUSGRAVE

HARVEY G. HUBBS

Secretary

KENT M. RAGSDALE

General Counsel

Mr. Harvey G. Hubbs
Secretary
Missouri Public Service Commission
P. O. Box 360
Jefferson City, Missouri 65102

Re: Case No. GS-83-236
In the matter of The Gas Service Company regarding an
explosion at 2208 Vine Street, Kansas City, Missouri
on January 12, 1983.

Dear Mr. Hubbs:

Enclosed for filing please find an original and fourteen
conformed copies of the Staff Accident Report in the above-
referenced case. This day, a copy of same has been sent to
the parties of record.

Thank you for your continuing cooperation.

Very truly yours,

Eric Kendall Banks
Assistant General Counsel

EKB:sld

cc: Mr. George R. Melling, Claims Manager, The Gas Service Co.
Office of Public Counsel

Mr. Dale Johansen, Manager, Gas Safety Dept., Mo. P.S.C.

Enclosures

MAILED
MAY 24 1983
P.O. BOX 360
JEFFERSON CITY, MO. 65102



Missouri Public Service Commission

Area Code 314
751-3234

P.O. BOX 360
JEFFERSON CITY
MISSOURI 65102

May 26, 1983

Commissioners

JOHN C. SHAPLEIGH

Chairman

LEAN BROCK MCCARTNEY

CHARLES J. FRAAS

LARRY W. DORITY

CHARLOTTE MUSGRAVE

HARVEY G. HUBBS

Secretary

KENT M. RAGSDALE

General Counsel

Mr. Harvey G. Hubbs
Secretary
Missouri Public Service Commission
P. O. Box 360
Jefferson City, Missouri 65102

Re: Case No. GS-83-236

In the matter of The Gas Service Company regarding an explosion at 2208 Vine Street, Kansas City, Missouri on January 12, 1983.

Dear Mr. Hubbs:

Enclosed for filing please find an original and fourteen conformed copies of the Staff Accident Report in the above-referenced case. This day, a copy of same has been sent to the parties of record.

Thank you for your continuing cooperation.

Very truly yours,

Eric Kendall Banks
Assistant General Counsel

EKB:sld

cc: Mr. George R. Melling, Claims Manager, The Gas Service Co.
Office of Public Counsel

Mr. Dale Johansen, Manager, Gas Safety Dept., Mo. P.S.C.

Enclosures



STAFF ACCIDENT REPORT

NATURAL GAS EXPLOSION

2208 VINE STREET

KANSAS CITY, MISSOURI

January 12, 1983

THE GAS SERVICE COMPANY

CASE NO. GS-83-236

OFFICIAL CASE FILE
MISSOURI PUBLIC SERVICE COMMISSION



FILED
MAY 25 1983
PUBLIC SERVICE
COMMISSION

ENGINEERING SECTION
GAS DEPARTMENT
UTILITY DIVISION

I N D E X

	<u>Page</u>
<u>SYNOPSIS</u>	1
<u>FACTS</u>	2 - 6
The Accident	2
Property Damage	2
Personal Injuries	2
Site Description	2
Meteorological Data	2
Gas System	2 & 3
Gas Company Notification and Actions	3 & 4
PSC Investigation	5
Figure 1	6
<u>ANALYSIS</u>	7
<u>CONCLUSIONS</u>	8
<u>RECOMMENDATIONS</u>	9
<u>APPENDIX A: Photographs</u>	10 - 15

SYNOPSIS

At approximately 9:50 a.m., CST, Wednesday, January 12, 1983, a natural gas explosion occurred in a single story commercial building at 2208 Vine Street, Kansas City, Missouri. The building was slightly damaged and the only occupant of the involved structure received minor injuries as a result of the incident.

The Staff of the Public Service Commission has determined the probable cause of the accident was the escape of natural gas from a fracture in a threaded nipple near the inside meter set location in the basement/crawl space of 2208 Vine. The escaping gas migrated from the basement/crawl space to the occupied area above, where it accumulated and was ignited. The most probable source of ignition was the natural gas water heater. The fracture in the nipple was the result of excavation work during scheduled service line replacement work at 2208 Vine.

Natural gas service in Kansas City is provided by The Gas Service Company.

FACTS

NOTE: Except for information gathered during the on-site investigation and/or during interviews, the information used to compile this portion of the report was obtained in record and/or statement form.

The Accident

At approximately 9:50 a.m., CST, Wednesday, January 12, 1983, an explosion occurred at 2208 Vine Street, Kansas City, Missouri.

Property Damage

The involved structure, a single story commercial building housing a barber shop, was slightly damaged by the explosion.

Personal Injuries

The only occupant of the building at the time of the explosion received minor injuries and was treated and released from a local hospital on the day of the incident.

Site Description

The structure is one of three buildings in the block on the west side of Vine Street and is located approximately in the middle of the block. It faces east and there is a vacant lot on each side separating it from the buildings on the corners.

The structure is constructed of brick and built on a stone foundation with a 2 to 3 foot high crawl space under approximately 3/4 of the structure. The area under the rear 1/4 of the structure had been excavated to a depth of about 6 feet. An entrance to the basement was located on the northwest corner of the building. (See Figure 1.)

Meteorological Data

The Flight Service Station located at the Kansas City Municipal Airport reported weather conditions at 9:49 a.m. on January 12, 1983, as: low scattered clouds; a temperature of 28°F; and a wind velocity of approximately 12 miles per hour from the south.

Gas System

Natural gas service in Kansas City is provided by The Gas Service Company (GSC).

Service to the Vine Street area is provided by an 8 inch cast iron main with bell and spigot joints, many of which have been clamped since installation. The main is buried parallel to and approximately 12 feet east of the west curb of Vine Street at a depth of 4 feet. (See Figure 1.)

The service line to 2208 Vine is 1 1/4 inch bare steel and extends west, perpendicular to the main, at a depth of 3 feet for a distance of approximately 45 feet. The service then turns 90° and enters the basement area. The meter set, which includes a service regulator, is located inside adjacent to the south foundation wall.

The service line was installed in 1904 with the main installation at a prior unknown date.

The maximum allowable operating pressure of the system in the Vine Street area is 5 pounds per square inch gauge (psig). The operating pressure at the time of the incident was approximately 30 inches water column (just over 1 psig).

Gas Company Notification and Actions

NOTE: Due to the nature of the circumstances surrounding this incident, this section will include a description of some events that occurred prior to the incident as well as a description of the actions taken by GSC subsequent to the accident.

In March of 1980, during a routine 90 day leak survey, GSC personnel detected and classified a Class 3 leak west of the curb at 2208 Vine. The 90 day frequency for surveys is a company policy for certain sections of the distribution system which includes the Vine Street area. Subsequent to this original discovery, records show this leak was found in various forms on numerous occasions during the routine 90 day surveys and the 6 month rechecks required by state regulations for a Class 3 leak.

During a 90 day mobile leak survey on December 17, 1982, a leak was again detected in front of 2208 Vine and placed on a list for further investigation and classification. This took place on December 28 and conditions at the scene warranted the leak to be classified as a Class 2 leak and a work report to repair the service line was written.

At approximately 8:35 a.m. on January 12, 1983, a GSC crew arrived at 2208 Vine to replace (insert) the existing steel service line with polyethylene and to move the meter set outside. The occupant was away at the time and was scheduled to return at approximately 9:00 a.m. The crew therefore began necessary outside preparation work while awaiting access to the structure.

The occupant arrived at approximately 9:05 a.m. and, after being informed of the work to be performed, let the crew in the basement area. While preparing for the work on the south side of the building an old stone foundation topped with brick was encountered adjacent to

the existing foundation. A supervisor was called to assist due to the possibility of problems presented by excavating the old foundation. The supervisor arrived about 9:30 a.m. and work commenced. (See Appendix A, Photograph 1.)

A backhoe worked for approximately 10 minutes over the service entrance on the south side of the building removing the old brick topped stone foundation and making an excavation. When the excavation neared the service line depth, the backhoe stopped and 2 crew members entered the excavation and continued digging with hand tools to expose the pipe. Upon entering the excavation, they smelled indications of natural gas which they assumed was leaking from piping outside the structure. One man continued digging and the other went to assist a third crew member in shutting off the gas at the valve box near the curb, but was unable to engage the key on the valve due to debris in the valve box.

At approximately 9:50 a.m. an explosion occurred in the building. The GSC crew at the scene notified the GSC dispatcher at 9:51 a.m. and requested the fire department and an ambulance be sent to the scene. Immediately after the explosion occurred, two crew members proceeded to the front door of the barber shop, found the occupant walking toward the door, and assisted him from the building to some distance away to await the ambulance. Fire extinguishers were placed around the building in anticipation of fire, but none occurred. Due to the inability to shut the gas off at the service line valve box, the service line was cut and plugged in the excavation at approximately 9:55 a.m.

GSC employees tested for natural gas in catch basins, manholes, and curb boxes along the 2200 block of Vine Street with combustible gas indicators. This survey detected no indications of natural gas in any of the locations checked.

An odorant test was conducted on January 12 at 2128 Vine and a "readily detectable odor" at a 0.45% gas-in-air concentration was noted.

Public Service Commission (PSC) accident reporting requirements were completed as follows:

1. The initial telephonic notice of the incident was made at approximately 11:45 a.m. on January 12.
2. Form PSC-G-1, the 36 hour preliminary written report, was completed on January 12 and received at the Commission on January 17.
3. Form PSC-G-2, the 60 day final written report, was completed on March 3 and received at the Commission on March 3.

The written reports both stated the service line was apparently pulled and separated at a corroded nipple during GSC repair activities.

PSC Investigation

Staff members from the Engineering Section of the Utility Division's Gas Department (Staff) arrived at GSC headquarters at approximately 10:30 a.m. on January 13. A narrative account of company actions taken on the day of the incident was given and various records concerning 2208 Vine were made available.

After discussions with GSC personnel, Staff proceeded to 2208 Vine to conduct an on-site investigation. The involved building had sustained only minimal explosive damage and no fire damage. The front plate glass window and the glass in the windows on the south side of the barber shop were broken out. The north wall was pushed out slightly and about 8 rows of brick, approximately 12 feet in length, from the roof parapet were dislodged and laying on the ground. (See Appendix A, Photographs 2, 3, and 4.)

The damage to the interior of the structure was also minor. The north wall was separated from the ceiling and some plaster was dislodged as a result of the explosion. (See Appendix A, Photograph 5.)

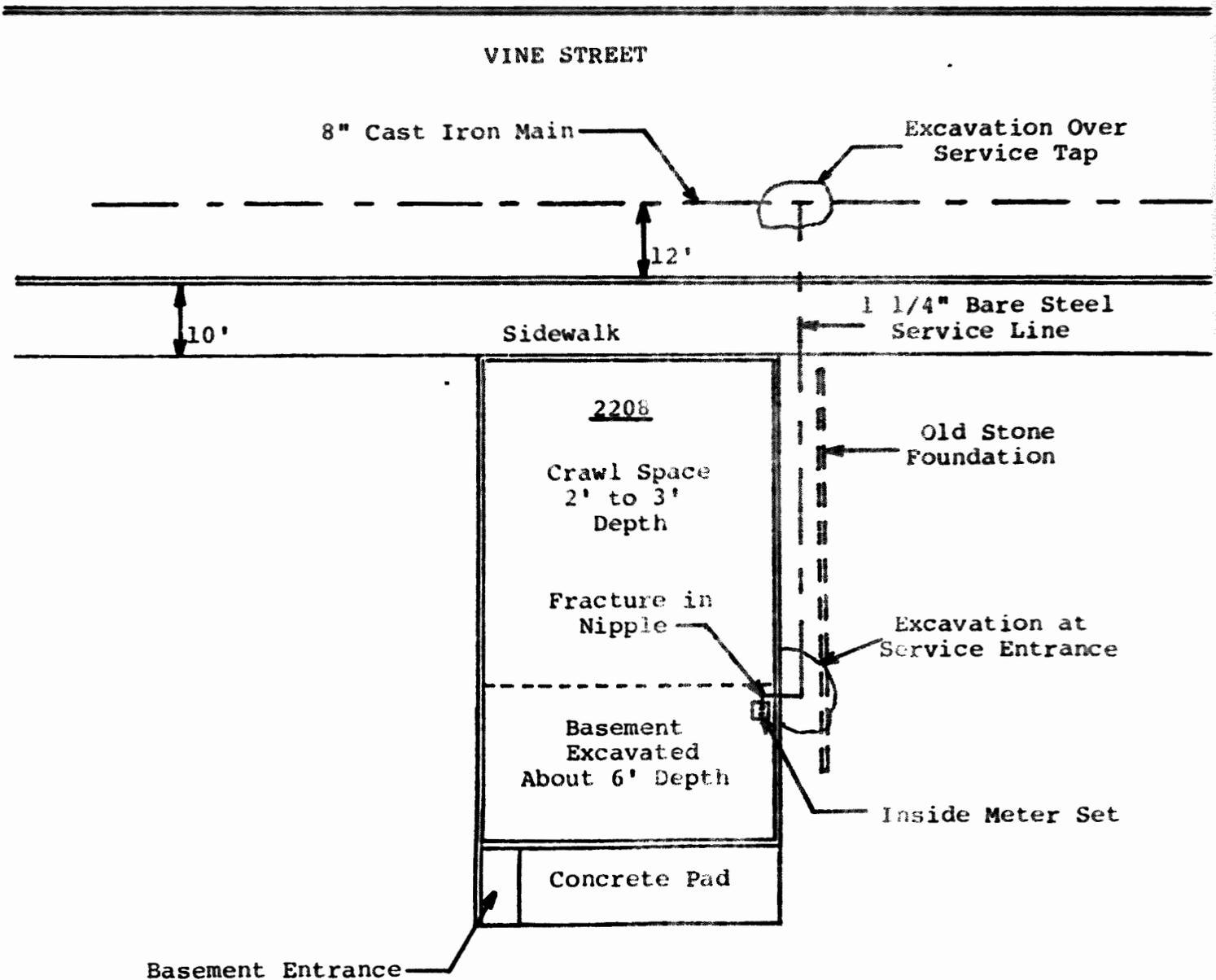
Inspection of the gas facilities revealed GSC had excavated over the service line entrance to the building where an old stone foundation was encountered. Also, a steel plate covered the excavation in the street over the main at the service tap. The inside meter set piping was found to be severely corroded and the fracture of the threaded pipe nipple was observed at a tee fitting near the point where the service line came through the foundation. (See Appendix A, Photographs 6, 7, and 8.)

On March 2, Staff returned to the GSC Central Plant facilities and conducted interviews with company leak crew personnel and took photographs of the meter set piping which had been removed from 2208 Vine. It was noted during this investigation that the interior of the pipe was corroded. (See Appendix A, Photograph 9.)



NOT TO SCALE

FIGURE 1
PLAN OF GENERAL AREA



ANALYSIS

Natural gas leaking from the fracture in the threaded service line nipple apparently migrated from the basement/crawl space to the barber shop area above. This gas accumulated to an explosive mixture and was ignited, with the most probable source of ignition being the natural gas water heater.

A contributing factor to the fracture may have been the severely corroded condition of the meter set piping due to atmospheric corrosion.

CONCLUSIONS

1. A natural gas explosion slightly damaged a business at 2208 Vine Street, Kansas City, Missouri, at approximately 9:50 a.m., CST, Wednesday, January 12, 1983.

2. The probable cause of the accident was the escape of natural gas from a fracture in a threaded service line nipple in the basement/crawl space of the building. The escaping gas migrated to and accumulated in the barber shop area above and was most likely ignited by the natural gas water heater.

3. The fracture in the nipple was caused by GSC personnel contacting the service line during excavation activity.

RECOMMENDATIONS

Staff recommendations to GSC would normally have been directed toward better implementation of company policies regarding monitoring of atmospheric corrosion; however, the company has undertaken actions, including a service manual revision, that should satisfy Staff concerns in this area. These actions are a result of discussions between GSC and Staff prior to the accident and are not related directly to it.

GS-83-236

Appendix A to Staff
Accident Report

See: Archives

Records Center Paper
Copy File