

**REPORT OF THE
STATE CORPORATION COMMISSION**

**UNDERGROUND UTILITY
LINE SEPARATION**

**TO THE GOVERNOR AND
THE GENERAL ASSEMBLY OF VIRGINIA**



SENATE DOCUMENT NO. 24

**COMMONWEALTH OF VIRGINIA
RICHMOND
2000**

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STATE CORPORATION COMMISSION

December 28, 1999

To: The Honorable James S. Gilmore, III
Governor of Virginia
and
The General Assembly of Virginia

We are pleased to submit the Report of the State Corporation Commission on Underground Utility Line Separation in response to Senate Joint Resolution No. 480.

Respectfully submitted,

Handwritten signature of Theodore V. Morrison, Jr. in black ink, written over a horizontal line.

Theodore V. Morrison, Jr.
Chairman

Handwritten signature of Hullihen Williams Moore in black ink, written over a horizontal line.

Hullihen Williams Moore
Commissioner

Handwritten signature of Clinton Miller in black ink, written over a horizontal line.

Clinton Miller
Commissioner

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**Report to the General Assembly
In Response to Senate Joint Resolution 480**

December 16, 1999

Executive Summary

The State Corporation Commission (“Commission”) submits this report to the General Assembly in response to Senate Joint Resolution No. 480 (“SJR480” or “resolution”). The resolution arose out of the concerns of the General Assembly and a July 7, 1998 explosion and fire at 25905 Rickmansworth Lane in the South Riding Subdivision in Loudoun County, Virginia. This accident resulted in the death of one person, severe burns to another, and slight injuries to two others. During the investigation of the accident, a 7/16-inch diameter hole was found in the gas service line owned and operated by the Washington Gas Light Company serving the house in close proximity to the faulted (or failed) electric service lines owned and operated by the Northern Virginia Electric Cooperative.

The General Assembly noted in SJR480 that “...[e]very year, thousands of miles of new utility lines are placed underground in the Commonwealth, and proper separation upon installation is essential to the safe operation and maintenance of these underground utility lines.” Following the July 7, 1998 accident, the General Assembly acted upon its concern relative to the proper separation of underground utility lines and, in SJR480, requested the Commission to “... determine whether regulations should be developed concerning electrical and gas utility facility separation.”

The resolution also requested that the Commission study and review at least the following: existing laws and regulations; the findings of the National Transportation Safety Board (“NTSB”) investigation of this accident; the results of a Voluntary Pilot Program in Loudoun County; and the actions of the Utility Industry Coalition of Virginia. The local, state, and national codes, standards, laws, and regulations were reviewed and no specific requirement for separation distances for underground gas and electric utilities were found. Several regulations exist for the separation of gas transmission lines and mains from other underground structures, and certain industry standards speak to the separation of underground electric facilities from other underground structures,

but none specifically address separation between electric and gas underground utility lines.

Section 56-257 of the Code of Virginia authorizes the Commission to establish minimum separation distances on public rights-of-way for all pipes and conduits; however, this code section has certain limitations that need to be addressed. Specifically, this section does not apply to direct-buried cable, facilities outside public rights-of-way, and underground utilities owned and operated by local governments or service authorities. In addition, this section is in conflict with certain regulations promulgated by the Commonwealth's Department of Health.

As stated earlier, the resolution asked the Commission to consider the NTSB findings concerning the accident in the South Riding Subdivision in Loudoun County. The NTSB has not issued any findings as of the date of this report. However, we have included certain information from its laboratory analyses and factual data in Part II of this report.

The results of the Voluntary Pilot Program on utility placement conducted in Loudoun County are discussed in this report. This program involved installations of new underground utility lines in a common trench.

The Utility Industry Coalition of Virginia has submitted a set of standards that include a minimum 12-inch radial separation for underground gas and electric facilities at the time of installation. However, these standards are voluntary, and not all electric and gas utility companies have agreed to follow the standards. Further, certain parts of the standards are vague, and do not encompass all underground utility lines.

After a careful review and analysis, the Commission is of the opinion that proper separation is essential to the safe operation and maintenance of all underground utility lines. Damage to these lines, regardless of who owns or operates them, or where they are located, poses a threat to the health, safety, and welfare of the people of the Commonwealth and the environment. Regulations should be developed for the proper separation of all underground utility facilities, including gas and electric, in both public and private rights-of-way. The General Assembly can accomplish this by either promulgating a law delineating separation distances, or by authorizing the Commission to develop separation standards for all underground utility lines.

I. INTRODUCTION

The 1999 Virginia General Assembly passed Senate Joint Resolution No. 480 (Attachment No. 1) in response to its own concerns relative to the proper separation of underground utility lines and the July 7, 1998 explosion and fire at 25905 Rickmansworth Lane in the South Riding Subdivision in Loudoun County, Virginia. The accident resulted in the death of one person, severe burns to another, and slight injuries to two children. The NTSB investigation as to the cause of the explosion has focused attention on the fact that the underground electric and gas service lines to the house destroyed by the accident were buried in close proximity to each other. As a result of the accident and its own concerns, the General Assembly requested the State Corporation Commission (“Commission”) to determine if regulations should be developed relative to minimum separation distances for underground electric and gas facilities.

Specifically, Senate Joint Resolution No. 480 requested the Commission to “...review and analyze preliminary and final NTSB findings concerning the Loudoun County accident, taking notice of the Voluntary Pilot Proposal which presently is underway in the community where that accident occurred; review any other actions or proposals undertaken by the Utility Industry Coalition of Virginia; seek information and assistance from public utilities within the Commonwealth, and from representatives of local governments; and review existing statutes and regulations regarding utility installation, service and maintenance.”

Part II of this report presents the results of the Commission’s review, research, and analysis. Part III is the discussion portion and Part IV contains the Commission’s recommendation.

II. COMMISSION'S RESEARCH AND REVIEW

As requested by SJR480, the Commission reviewed and conducted research relative to the underground utility separation issue. Our review included the following:

A. NATIONAL TRANSPORTATION SAFETY BOARD INVESTIGATION

The National Transportation Safety Board began an investigation of the July 7, 1998 accident in the South Riding Subdivision in Loudoun County concurrently with the Staff of the State Corporation Commission. According to the NTSB, their investigation involves four separate reports. The first NTSB report has been published and contains the results of the laboratory analyses on various sections of the electric and gas facilities that may have contributed to the accident. The analyses found that the hole in the gas service line was caused by heat. The lead investigator for the NTSB has stated that "we didn't identify any other source of heat besides the [power] cables." The laboratory examination also revealed nicks, cuts, scuffs, and abrasions on the tracer wire for the gas service line and on all three electric service cables. According to the NTSB laboratory analyses, several of the nicks and cuts were "...consistent with a slice made by a sharp object."

The second NTSB report will be published shortly. It will contain the factual data identified by the NTSB investigators relative to the accident. A draft of this report was provided to the Commission. The data within this draft report reflects a vertical separation of the electric and gas service lines to the house of one inch or less based upon the excavation immediately following the accident. A search of the installation records for the utility services found that both the electric and gas lines to the house were installed in several stages over time. The electric lines and the electric service stub to the house were installed sometime between January and April, 1997. The final electrical connection to the house was made on April 22, 1998. Apparently, between the time the electric lines were installed, and the electric meter was set at the house, the electric lines were damaged. After connecting the meter, the Northern Virginia Electric Cooperative ("NOVEC") noted that the house had no electricity. After checking the electric lines, NOVEC found and repaired two faults at the time of installation on April 22, 1998.

One fault occurred where the sewer and water lines crossed the electric lines in front of the residence. The electric repair crews reported that the faulted lines had evidence of abrasion damage from bricks and other buried debris. The second fault was located where the telephone lines were installed crossing the electric lines. Following the repair of these two faults, the electric service was operating properly.

On June 15, 1998, NOVEC received a complaint from a contractor working on the residence. The cooperative responded and found an additional fault on the electric line. Upon excavation of the faulted portion of the electric service line, the electric repair crew noted the presence of the gas service line and its associated tracer wire. According to NOVEC's crew, the gas and electric lines had approximately six inches of separation at that time. The NTSB did not identify any written company policies for NOVEC or Washington Gas Light Company ("Washington Gas") that required minimum separation distances from other underground structures for their respective service lines.

The third NTSB report relates to the survival factors of the accident and has been published. It contains such information as the response times for the emergency crews, damage estimate costs, and medical and pathological data.

The fourth NTSB report will contain the findings and recommendations of its investigators. It is expected that the findings and recommendations will be presented to the National Transportation Safety Board during a public hearing in March, 2000.

B. VOLUNTARY PILOT PROGRAM

The Voluntary Pilot Program ("Pilot") was initiated in January, 1998 as a result of discussions held between the developers of the South Riding Subdivision in Loudoun County, and the electric, gas, telephone, and cable television utility companies. Over the next several months, the utility companies in the area agreed upon a contractor to perform the joint trenching. The profile of the trench to be used for the Pilot Program was being established at the time of the July 7, 1998 accident. Subsequent to the accident, another contractor was selected and approximately 4,360 feet of gas, electric,

telephone, and cable television utility lines were installed. There were four utility companies involved in the Pilot Program:

Washington Gas
Northern Virginia Electric Cooperative
GTE
Loudoun CableVision

Following the joint installation of the facilities, Washington Gas reviewed the project and found several advantages. First, the joint installation ensured consistent placement of utilities which could reduce the possibility of damage caused by excavation activities and lessen the amount of easement needed. Second, it ensured that the separation between utilities was maintained. Third, the use of a single contractor eliminated scheduling problems and provided a single point of contact for the developer/builder.

Two other impacts identified were:

- Each utility's design requirements - Joint installation required the facilities to be installed to the highest design criteria among the utilities.
- Cost - The utilities experienced an overall increase in cost of 30% primarily as a result of the additional backfill requirements (i.e., install a utility facility, backfill, install the next facility, backfill, etc.).

Washington Gas feels that the negative impacts are not insurmountable. Washington Gas has committed to study this issue further to eliminate obstacles in the development of a Uniform Construction Practice. The Commission has not received any comments from other utilities involved in the Voluntary Pilot Program.

C. UTILITY INDUSTRY COALITION OF VIRGINIA

The Utility Industry Coalition of Virginia ("Coalition") was formed to, among other things, develop voluntary underground utility facility separation standards for all gas and electric underground utility lines. The membership consists of representatives from the electric and gas utility companies in the

Commonwealth. The Coalition recognized that “...every year, thousands of new utility lines are placed underground in the Commonwealth, and seeks to establish uniform separation standards to enhance accessibility, maintenance and protection of these underground utility lines.”

On September 30, 1999, the Coalition submitted to the Commission a set of separation standards agreed to by all of the 12 regulated electric cooperatives, one of the 5 investor-owned electric companies, and 4 of the 11 investor-owned gas companies. A list of the utilities that have agreed to these standards is included as Attachment No. 2 to this report. The separation standards, the quality control, and some general understandings provided by the Coalition are as follows:

Separation Standards

- *The Utility Industry Coalition accepts that if a 12-inch radial separation can be achieved between electric and gas facilities, no special precautions are necessary.*
- *If 12-inch radial separation between electric and natural gas facilities cannot be achieved or determined, the Utility Industry Coalition commits that a company-approved shield or protective barrier will be installed by the subsequent utility.*
- *When there is less than 12-inch radial separation, electric and natural gas facilities and their company-approved shields or protective barriers will be installed in a manner that will provide the maximum amount of spacing that is practical for both utilities to conduct future maintenance after backfill operations are complete.*
- *Standards for trenchless excavation will follow the above separation standards and will use “test holes” or other methodology to ensure compliance with the standards.*

Quality Control

- *Each utility will take responsibility for ensuring compliance with these standards.*

General Notes

- *Utility Industry Coalition separation standards represent electric and gas only and apply to both public and private property.*
- *Utility Industry Coalition separation standards refer to “at time of installation” due to the lack of control by utilities over above-surface construction activity which could cause subsurface compaction to bring facilities slightly closer than their original separation.*
- *Utility Industry Coalition separation standards apply to new and direct burial replacement construction and compliance shall continue throughout any associated maintenance.*

It should be noted that these standards are voluntary and not agreed to by all Virginia gas and electric utilities. At least one electric utility has indicated that they will not agree to follow these standards. The Coalition has not specified what a “company-approved shield or barrier” is, nor which Company’s shield or barrier will be used when 12-inch separation cannot be obtained.

D. LOCAL CODES, REGULATIONS, ETC.

In an effort to identify if any local codes, standards, or regulations existed that specified minimum separation distances for electric and gas utilities, all 324 cities, counties, and towns within the Commonwealth were surveyed by the Commission Staff. Of the 192 responses, 28 included regulations that pertained either to the separation of water and sewer facilities, or to the minimum depths of cover for certain utility lines. Several localities had minimum separation distances for other utilities from water and sewer lines. However, no specific references to electric and gas facility separation were noted. Several of the localities stated that they were considering developing standards for the separation of underground utilities. These localities are interested in developing standards, not only to improve the safety and reliability of service, but also to better manage the ever-decreasing available space for the installation of new underground utility lines.

E. VIRGINIA LAW

Section 56-257 of the Code of Virginia (Attachment No. 3), enacted in 1919, was amended by the 1996 General Assembly to authorize the Commission to promulgate minimum separation standards for certain underground utility facilities. These standards would be applied to pipes and conduits installed by corporations in public rights-of-way. The amendment also limited these standards to a maximum of three feet horizontally and where pipes and conduits cross, to twelve inches from any other underground structures.

The amendment provided an opportunity for the Commission and the other stakeholders to develop separation standards that would recognize modern installation practices and take advantage of the technological improvements that have occurred in underground utility construction since the original law was passed in 1919. In an effort to assist the Commission in the development of separation standards, the Commission's Staff formed a Joint Government-Industry Task Force ("Task Force"). The Task Force was comprised of the stakeholders affected by the law including, but not limited to, underground facility operators, excavators, locators, state agencies, and local governments.

The Task Force spent several months researching existing laws, reviewed technological changes, and identified limitations with Section 56-257, as amended. Its review of the existing regulations or standards did not find any that were specific to the separation of electric and gas facilities. Upon completion of their study, the Task Force identified certain limitations within Section 56-257. The limitations identified are:

1. Section 56-257 does not specifically address direct-buried cable, i.e., Cable television, telecommunications, electric, etc. The Section reads, in part, "...any pipe or conduit..." The term "conduit" is not precisely defined in this Section or elsewhere in the Code of Virginia.
2. Section 56-257 does not apply to underground facilities located outside the public rights-of-way. The Section states, in part, "...laying any pipe or conduit in any of the public roads in the counties, or in any of the public parks, streets, avenues, or alleys in the cities or towns of this Commonwealth..."

3. Section 56-257 does not apply to underground utilities owned and operated by local governments and service authorities. The Section is applicable to “corporations”. In contrast, Virginia Department of Health Waterworks Regulation 12-VAC-5-590-1150 does apply to local governments and service authorities.
4. Section 56-257 is in conflict with Virginia Department of Health Waterworks Regulation 12-VAC-5-590-1150. The Waterworks Regulation specifies that the minimum separation between water and sewer lines (under normal conditions) is “...at least ten feet horizontally and eighteen inches vertically.” Section 56-257 states that the distance can “...in no case...exceed three feet or, where said pipes or conduits cross, twelve inches from any other underground structure.”
5. Section 56-257 does not allow for exemptions or waivers for special circumstances such as in the case of joint or common trenches.

F. VIRGINIA DEPARTMENT OF TRANSPORTATION

The Virginia Department of Transportation (“VDOT”) does not currently have any regulations relative to the separation of underground utility lines. VDOT regulations speak to either depths of cover for underground utility lines, or require the utility owner to comply with “all applicable codes, standards, specifications, and regulatory authority requirements.” These VDOT regulations only apply to those underground utility lines located within an easement owned by VDOT.

G. PIPELINE SAFETY REGULATIONS

The Commission administers a pipeline safety program for certain facilities in the Commonwealth. These facilities include investor-owned gas utilities, master meter gas systems, gas storage facilities, certain landfill gas operations, and intrastate hazardous liquid pipelines. The Commission does not have any pipeline safety authority over interstate natural gas and hazardous liquid

operators or the three municipal gas systems serving the cities of Charlottesville, Danville, and Richmond. Instead, the Federal Government, via the Office of Pipeline Safety in the Department of Transportation regulates these systems.

The Commission has adopted various parts of Title 49, Code of Federal Regulations ("C.F.R.") as the minimum gas pipeline safety regulations in Virginia. These regulations detail minimum standards for all aspects of the installation, operation, and maintenance of gas transmission, main, and service lines and hazardous liquid lines. Section 192.325(a) of Title 49, C.F.R., states "[e]ach transmission line must be installed with at least 12 inches of clearance from any other underground structure...[and] if this clearance cannot be attained, the transmission line must be protected from damage that might result from the proximity of the other structure." Section 192.325(b) of Title 49, C.F.R., speaks to the installation of natural gas mains by stating, in part, "[e]ach main [to] be installed with enough clearance from any other underground structure to allow proper maintenance and to protect against damage that might result from proximity to other structures." The regulations do not contain any requirement for the separation of natural gas service lines from other underground structures.

With respect to hazardous liquid pipeline facilities, Section 195.250, of Title 49 C.F.R., states, in part, that "[a]ny pipe installed underground must have at least 12 inches of clearance between the outside of the pipe and the extremity of any other underground structure, except that for drainage tile the minimum clearance may be less than 12 inches but not less than 2 inches. However, where 12 inches of clearance is impractical, the clearance may be reduced if adequate provisions are made for corrosion control."

As is obvious, each of the above-referenced regulations for gas and hazardous liquid facilities mandates minimum separation distances from all other underground structures, not just electric facilities.

H. RESEARCH OF REGULATIONS THROUGHOUT THE UNITED STATES

The research of existing regulations was accomplished via several avenues. First, a survey was disseminated to the National Association of Pipeline Safety Representatives ("NAPSR"). The NAPSR is an organization

comprised of the program managers for each state with a natural gas or hazardous liquid pipeline safety program certified by the Federal Office of Pipeline Safety ("OPS"). The survey did not identify any state regulations specific to the separation distance between gas and electric utility facilities.

Secondly, immediately following the accident in the South Riding Subdivision in Loudoun County, OPS formed a committee to study the separation between electric and gas facilities. This committee consists of representatives from the OPS, the NTSB, the American Gas Association, the American Public Gas Association, the Institute for Electrical and Electronic Engineers, and the State Corporation Commission. A literature and Internet search of existing laws by this committee did not identify any mandatory separation standards relative to gas and electric facilities other than those regulations noted earlier. The work of this committee is ongoing.

Third, industry standards were studied. The National Electric Safety Code ("NESC") does address the separation distance of direct-buried cable. Section 352 of the NESC speaks to the separation distance of direct-buried cable and other underground structures. It specifies a minimum of 12 inches of clearance unless all parties are in agreement with a lesser clearance and appropriate protective measures are taken. As with the Commission's pipeline safety regulations, this electric industry standard is not limited to gas facilities; it applies to all other underground structures. Nonetheless, the NESC is a voluntary industry standard.

The Virginia Department of Health Waterworks Regulation 12-VAC-5-590-1150 specifies a minimum separation distance of 10 feet for water and sewer mains. Under unusual conditions, less separation may be provided with certain conditions. A copy of the regulation is found in Attachment No. 4 to this report.

I. COMMISSION DAMAGE PREVENTION EXPERIENCE

The State Corporation Commission was authorized to enforce the provisions of the Underground Utility Damage Prevention Act ("Act") effective January 1, 1995. The Act places various responsibilities on underground utility operators, excavators, notification centers, and contract locators.

As excavation related damage was, and continues to be, the leading cause of gas pipeline accidents, the jurisdictional gas companies were required to report all damages to their facilities beginning March 1, 1996. Damage to gas pipelines is very serious and may result in catastrophic consequences.

The damage reports received by the Commission are investigated by the Commission's Staff and the results are presented to the Advisory Committee established under Section 56-265.31 of the Code of Virginia. The investigation results of more than 7,779 reports of "probable violations" of the Act received thus far reveal that the Commission's efforts since 1996 have resulted in a significant reduction in damage to gas pipelines in Virginia. Attachment No. 5 to this report presents the pipeline damages per 1,000 notice of excavation requests ("tickets") for 1996 through October, 1999.

The Commission's data also reveal that 40% of the "probable violations" of the Act cited are a result of not marking or mis-marking of underground utility lines. Mis-marking of underground utility lines is often caused by a problem known as "signal bleed off". This problem can arise when the preferred method of locating facilities is used. Using this method, a signal is induced onto a utility line and specialized instrument is used to trace the signal's path along the utility line. Unfortunately, if the underground utility line with an induced signal is in close proximity to others, the signal can "bleed off" to other utility lines, thus causing improper marking of the desired facility.

Proper separation of underground utility lines will reduce signal bleed off, result in accurate marking of facilities and reduce the risk of damage to underground utility lines. Any reduction in damage provides not only safety benefits, but also economic savings to the citizens of the Commonwealth. Damage to underground utility lines costs the excavator time; the utility operator time, materials, and lost revenue; business owners lost revenues; inconveniences the public, and may result in higher utility rates for everyone.

III. DISCUSSION

Today, thousands of miles of utility lines, pipes, and cables transport essential services to the cities, homes, and businesses throughout the Commonwealth. A single electric cable lights up an entire community, while the fuel for heating thousands of homes and powering automobiles flows beneath our feet. Millions of transactions supporting our economy are completed via underground communication systems, the same systems that provide fast and life saving assistance to those in need. In short, our citizens rely on this underground network to support and improve the quality of their lives each and every day.

Our demand for utility services continues to grow. Our desire to place most of the facilities underground reduces the available space as existing and abandoned facilities are joined by new installations. In certain areas of Northern Virginia for example, eight to ten utilities have placed multiple underground utility lines within a narrow easement. The crowding of this subterranean corridor is making it more difficult for utility companies to perform operations and maintenance functions on their underground facilities without damaging other underground utility lines. Furthermore, multiple utility lines in close proximity may result in mis-located facilities thereby increasing the risk of damage to the underground utility lines.

The importance of telecommunications, whether telephone or cable television, continues to increase. The rising demand of individuals and businesses for services to transport data, voice and video via the various fiber optic or other networks is creating an ever-increasing need for additional, faster networks with minimal service interruptions. Weather alerts are sent out via cable television. Fiber optic networks are providing Internet access which hospitals may use for monitoring outpatients. These same patients have a need for uninterrupted power service for their medical equipment. Citizens may be forced to leave their home if water and sewer lines are damaged. Public health is placed at risk by raw sewage spilled via damaged sewer utility lines.

The Commission's review and analysis in preparation for this report found that certain laws, regulations, codes and standards address the separation issue. As discussed in Part II of this report, Section 56-257 of the Code of Virginia establishes certain standards for pipes and conduits in public rights-of-way for corporation-owned facilities. The Virginia Department of Health's ("VDEH") Waterworks Regulations delineate minimum separation standards

for water and sewer mains. While local city, county, and town codes incorporate the VDEH regulations, they do not address separation for other utilities. Several localities informed the Commission that they plan to develop, or are considering development of, separation standards. The localities considering development of standards are doing so, not just from a safety and reliability of service perspective, but to better manage the ever-decreasing space available for the installation of new underground utility lines.

The Federal pipeline safety regulations, adopted by the Commission, establish separation distance requirements for certain gas and hazardous liquid pipelines from other underground structures. The regulations apply to the gas and hazardous liquid transmission lines and mains on both public and private rights-of-way. They do not apply to gas service lines such as the one that was damaged in the Loudoun County accident.

The industry standard used by the electric and communication utilities (the National Electrical Safety Code) establishes separation requirements relative to electric and communication facilities from other underground structures regardless of location. However, it should be noted that these are voluntary industry standards.

The Virginia utility companies research through the Voluntary Pilot Program revealed that consistent placement of utilities could reduce damage to these underground utility lines and lessen the amount of easement needed. The Utility Industry Coalition has also recognized the need for separation and recommended a voluntary standard.

The Commission's damage prevention experience has demonstrated that adequate separation of underground utility lines aids in the accurate locating of the facilities thereby reducing the risk of damage. A review of the reports received by the Commission's damage prevention staff reveals that the majority of the damage to underground utilities occurred during the installation of other utilities.

Gas and electric facilities in close proximity may increase the possibility of explosions or fire which can be catastrophic. However, anytime gas lines are damaged, whether during installation activities or during repair activities of non-gas utilities, explosions or fire can result, sometimes years after the damage. For example, on February 3, 1994, a two story commercial building in Greeley, Colorado exploded, injuring 24 people, six critically. The cause of

the explosion was traced to a steel gas line that broke at the point where it had been damaged during the installation of a telephone conduit in 1976. After approximately 18 years, the line failed at the point of damage. Natural gas migrated into the building which subsequently exploded.

Based upon the foregoing, it is obvious that a need for a separation standard for all underground utility lines exists. The many regulations and voluntary standards extant recognize the importance of proper separation for underground utility lines. Indeed, even the General Assembly recognized this in SJR480 when it said that "...proper separation...is essential to the safe operation and maintenance of...underground utility lines." Providing minimum separation standards reduces the risk of damage to the underground utility lines. This fact enhances public safety, mitigates environmental damage, minimizes interruption of service, and reduces the economic loss to the citizens and businesses of the Commonwealth.

The General Assembly requested the Commission to determine if regulations should be developed for gas and electric underground utility lines. Our research showed us that we must look beyond providing minimum separation distances for only gas and electric facilities. While the explosion and fire in the South Riding Subdivision in Loudoun County was a terrible accident, our focus should not be limited to catastrophic events. We must consider protection of public health, the environment, and service interruptions as well. Mitigating damage to all underground utility lines, regardless of the owner or location, increases public safety, reduces the threat to the environment, minimizes service interruptions, and provides cost benefits to the citizens of the Commonwealth.

IV. RECOMMENDATION

Based upon the information contained in the “Discussion” section of this report, the Commission is of the opinion that minimum separation distances should be established, not only for electric and gas utilities, but for all underground utility lines.

Separation standards may be provided in different ways. First, the General Assembly could enact legislation mandating specific separation distances for underground utility lines. It would be difficult for legislation to anticipate technological developments or exceptions that might be appropriate.

A more flexible approach would be to amend Section 56-257 of the Code of Virginia to direct the Commission to develop separation standards for all underground utility lines. Prior to the adoption of any standards, the Commission must give notice to the public and afford interested persons an opportunity to present evidence and be heard. Standards developed by the Commission could provide for appropriate exceptions and be promptly amended to address new technological developments.

1999 SESSION

ENROLLED

SENATE JOINT RESOLUTION NO. 480

Requesting the Virginia State Corporation Commission to determine whether regulations should be developed concerning electrical and gas utility facility separation.

Agreed to by the Senate, February 17, 1999

Agreed to by the House of Delegates, February 15, 1999

WHEREAS, in July 1998 a natural gas explosion destroyed a newly constructed home in Loudoun County; and

WHEREAS, the incident is currently under investigation by the National Transportation Safety Board (NTSB), and the Virginia State Corporation Commission (SCC); and

WHEREAS, one issue being investigated is whether electrical cable and natural gas pipe at the Loudoun County residence may have been installed too close together; and

WHEREAS; the SCC regulates, among other things, investor-owned and member-owned electric, gas, telephone, water and sewer utilities; administers a pipeline safety inspection program; and monitors utility construction programs and service quality; and

WHEREAS, every year thousands of miles of new utility lines are placed underground in the Commonwealth, and proper separation upon installation is essential to the safe operation and maintenance of these underground utility lines; and

WHEREAS, the Utility Industry Coalition of Virginia, an industry organization of electric and gas companies, has been organized to address issues related to the initial construction separation of underground gas and electric facilities; and

WHEREAS, a two-part initiative, which includes a Voluntary Pilot Proposal for all new construction and a Utility Industry Coalition of Virginia Forum in 1999, has been proposed by the Coalition; and

WHEREAS, it is appropriate to determine whether state regulations should be developed and implemented concerning appropriate separation between underground utility lines to ensure safety for Virginia's citizens; now, therefore, be it

RESOLVED by the Senate, the House of Delegates concurring, That the Virginia State Corporation Commission be requested to determine whether regulations should be developed concerning electrical and gas utility facility separation. The SCC shall review and analyze preliminary and final NTSB findings concerning the Loudoun County incident, taking notice of the Voluntary Pilot Proposal which presently is underway in the community where that incident occurred; review any other actions or proposals undertaken by the Utility Industry Coalition of Virginia; seek information and assistance from public utilities within the Commonwealth, and from representatives of local governments; and review existing statutes and regulations regarding utility installation, service and maintenance.

All agencies of the Commonwealth shall provide assistance to the SCC for this study, upon request.

The Virginia State Corporation Commission shall complete its work in time to submit its findings and recommendations to the Governor and the 2000 Session of the General Assembly as provided in the procedures of the Division of Legislative Automated Systems for the processing of legislative documents.

Utility Industry Coalition of Virginia

VOLUNTARY UNDERGROUND UTILITY FACILITY SEPARATION STANDARDS

The following companies are committed to ensuring continued operations, maintenance, safety and efficiency in the utility industry. To demonstrate that commitment, they have pledged compliance with the attached voluntary underground utility facility separation and quality control standards, effective January 1, 2000.

- A&N Electric Cooperative
- BARC Electric Cooperative
- Central Virginia Electric Cooperative
- Community Electric Cooperative
- Craig-Botetourt Electric Cooperative
- Mecklenburg Electric Cooperative
- Northern Neck Electric Cooperative
- Northern Virginia Electric Cooperative (note additional comment on pledge form)
- Prince George Electric Cooperative
- Rappahannock Electric Cooperative
- Roanoke Gas
- Shenandoah Gas
- Shenandoah Valley Electric Cooperative
- Southside Electric Cooperative
- Virginia Natural Gas
- Virginia Power
- Washington Gas

§ 56-257. Manner of laying pipes, etc.

Every corporation organized for any of the purposes enumerated in § 56-256, in laying any pipe or conduit in any of the public roads in the counties, or in any of the public parks, streets, avenues, or alleys in the cities or towns of this Commonwealth, to be used for the purposes of such company, shall install such pipe or conduit with minimum clearance as may be specified by the Commission but in no case to exceed three feet or, where said pipes or conduits cross, twelve inches from any other underground structure to allow proper maintenance and to protect against damage that might result from proximity to other structures.

In addition to the requirements of this section, each pipe or conduit shall be installed with sufficient clearance, or shall be insulated from any source of heat, so as to prevent the heat from impairing the serviceability of the pipe or conduit.

(Code 1919, § 4059; 1996, c. 278.)

The 1996 amendment rewrote this section which formerly read: "Every corporation organized for any of the purposes enumerated in § 56-256, in laying any pipe or conduit in any of the public roads in the counties, or in any of the public parks, streets, avenues, or alleys in the cities or towns of this Commonwealth, to be used for the purposes of such company, shall lay the same at a distance of not less than three feet, if possible, from the outside of any water or gas pipe, or other pipe or conduit, already laid, except in cases where it shall be necessary that such pipes or conduits shall cross any water or gas pipe, or other pipe or conduit, and in such cases the pipes or conduits shall be at least twelve inches distant from the outside of any water or gas pipe, or other pipe or conduit, already laid."

Law review. - For note discussing the issues of eminent domain and water allocation as related to coal slurry pipelines, see 17 U. Rich. L. Rev. 789 (1983).

C. No flushing device shall be directly connected to any sewer.

12 VAC 5-590-1140. Installation of water mains.

A. Adequate supports shall be provided for all pipes.

B. A continuous and uniform bedding shall be provided in the trench for all buried pipe.

C. Stones and rocks found in the trench shall be removed for a depth of at least six inches below the bottom of the pipe and selected fill bedding provided.

D. The specifications for installation shall include:

D 1. Pressure testing on installed pipe;

D 2. Allowable leakage of installed pipe; and

D 3. Reference to applicable American Water Works Association standards or manufacturers' recommended installation procedures.

E. Any plastic or other nonmetallic pressurized conduit installed underground shall have affixed thereto a material conductive of electricity or some other means of locating the conduit while it is underground.

12 VAC 5-590-1150. Separation of water mains and sewers.

A. The following factors shall be considered in providing adequate separation of water mains and sewers:

A 1. Materials and types of joints for water and sewer mains;

A 2. Soil conditions;

A 3. Service branch connections into the water main and sewer mains;

A 4. Compensating variations in the horizontal and vertical separations;

A 5. Space for repairs and alterations of water and sewer mains;

A 6. Offsetting of pipes around manholes; and

A 7. Identification of the physical restraints preventing normal separation.

B. Parallel installation.

B 1. Under normal conditions water mains shall be laid at least 10 feet horizontally from a sewer or sewer manhole. The distance shall be measured edge-to-edge.

B 2. Under unusual conditions when local conditions prevent a horizontal separation of 10 feet, the water main may be laid closer to a sewer or sewer manhole provided that:

B 2 a. The bottom (invert) of the water main shall be at least 18 inches above the top (crown) of the sewer;

B 2 b. Where this vertical separation cannot be obtained, the sewer shall be constructed of AWWA approved water pipe, pressure tested in place without leakage prior to backfilling; and

B 2 c. The sewer manhole shall be of watertight construction and tested in place.

C. Crossing.

C 1. Under normal conditions water lines crossing sewers shall be laid to provide a separation of at least 18 inches between the bottom of the water line and the top of the sewer whenever possible.

C 2. Under unusual conditions when local conditions prevent a vertical separation described in subdivision C 1 of this section, the following construction shall be used:

C 2 a. Sewers passing over or under water mains shall be constructed of the materials described in subdivision B 2 b of this section; and

C 2 b. Water lines passing under sewers shall, in addition, be protected by providing:

C 2 b (1). A vertical separation of at least 18 inches between the bottom of the sewer and the top of the water line;

C 2 b (2). Adequate structural support for the sewers to prevent excessive deflection of the joints and the settling on and breaking of the waterline; and

C 2 b (3). That the length of the water line be centered at the point of the crossing so that joints shall be equidistant and as far as possible from the sewer.

D. No water pipes shall pass through or come in contact with any part of a sewer manhole.

12 VAC 5-590-1160. Valve, air relief, meter, and blowoff chambers.

A. Air and sediment accumulations may be removed through a standard fire hydrant; compressed air and pumping may be used for dewatering mains through hydrants.

B. Chambers or pits containing valves, blowoffs, meters, or other such appurtenances to a distribution system shall not be connected directly to any storm drain or sanitary sewer, nor shall blowoffs or air relief valves be connected directly to any sewer.

C. Such chambers or pits shall be drained to the surface of the ground where they are not subject to flooding by surface water or to absorption pits located above the seasonal groundwater table elevation. Sump pumps may be used where other means are not practicable.

D. The open end of an air relief pipe shall be extended from the manhole or enclosing chamber to a point at least one foot above ground and provided with a screened, downward facing elbow.

12 VAC 5-590-1170. Hydrants.

A. Where hydrant drains are not plugged, they shall be drained to the ground surface or to dry wells provided exclusively for this purpose.

B. Hydrant drains shall not be connected to sanitary sewers or storm drains.

C. Fire hydrants shall be connected only to water systems adequately designed for fire flows in addition to domestic flow.

12 VAC 5-590-1180. Surface water crossings.

Surface water crossings, both over and under water, present special problems and should be discussed with the commissioner before final plans are prepared.

A. Above water crossings.

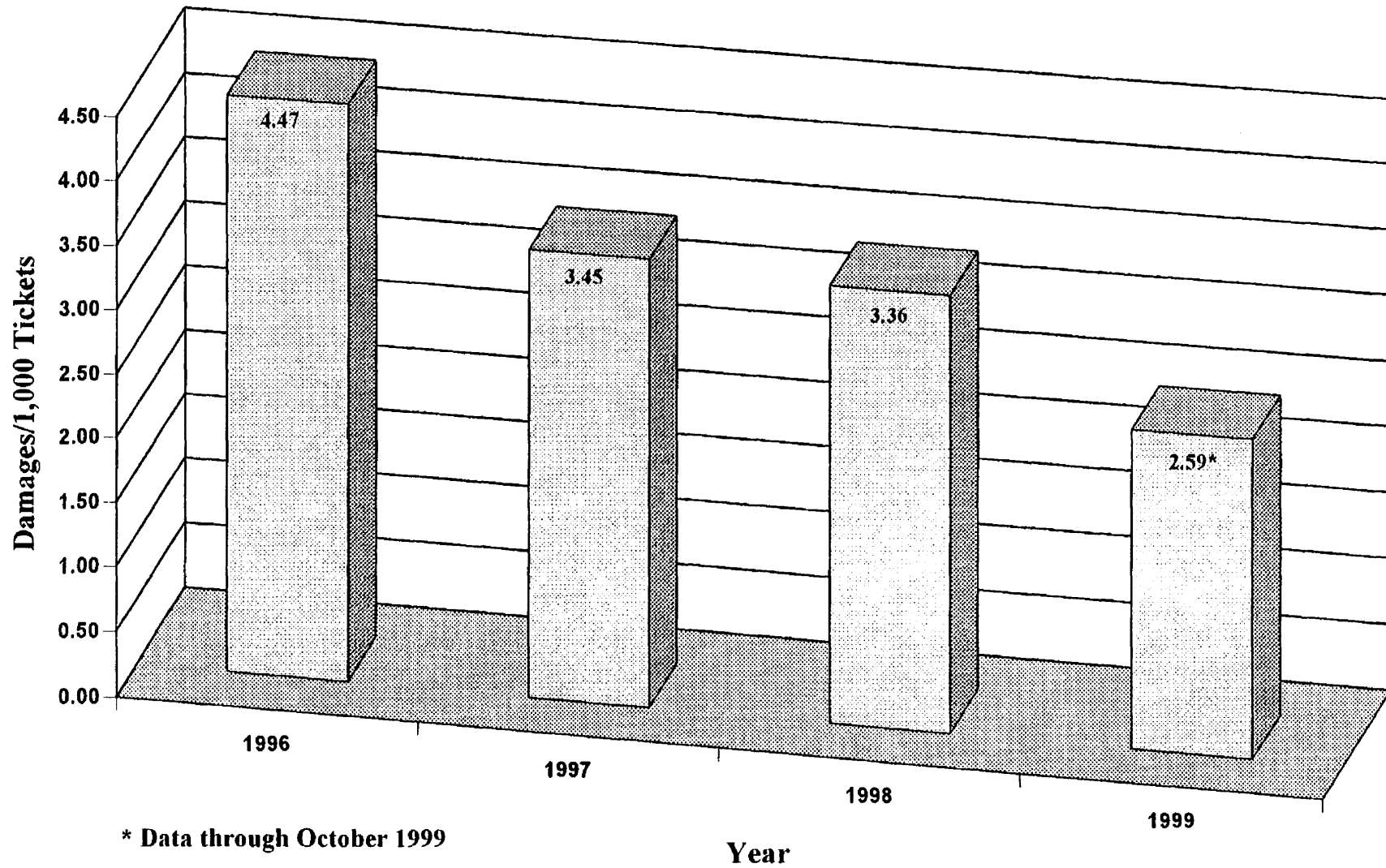
The pipe above water crossings shall be:

A 1. Adequately supported;

A 2. Protected from freeze damage;

A 3. Accessible for repair or replacement; and

TOTAL STATEWIDE GAS FACILITY DAMAGES PER 1,000 TICKETS (VIRGINIA)



* Data through October 1999

