ASSESSMENT OF THE NEED
FOR AN IMPROVED INSPECTION PROGRAM
FOR
MASTER METER SYSTEMS

January 2002

A Report of the
Secretary of Transportation to the Congress,
prepared pursuant to Section 108 of
Public Law 100-561

FOREWORD

This report was prepared by the Volpe National Transportation Systems Center (Volpe Center), Research and Special Programs Administration (RSPA), U.S. Department of Transportation (U.S. DOT), Cambridge, Massachusetts, for the Office of Pipeline Safety (OPS), RSPA/U.S. DOT, Washington, D.C. Paul Zebe of the Volpe Center and Ralph Kubitz of OPS compiled the material for the report. Contributions to the report were also made by Lloyd Ulrich of OPS.

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LIST OF ACRONYMS & ABBREVIATIONS

CL&P . . . . . Connecticut Light and Power

LPG . . . . . Liquefied Petroleum Gas

MAOP . . . . . Maximum allowable operating pressure

MN OPS . . . . . Minnesota Office of Pipeline Safety

NAPSR . . . . . National Association of Pipeline Safety Representatives

NARUC . . . . . National Association of Regulatory Utility Commissioners

O&M . . . . . Operations and Maintenance

OH PUC . . . . . Ohio Public Utilities Commission

OPS . . . . . Office of Pipeline Safety, RSPA, U.S. DOT

OQ . . . . . Operator Qualification

psig . . . . . Pounds per square inch gauge

RSPA . . . . . Research and Special Programs Administration, U.S. DOT

SASC . . . . . Systems & Applied Sciences Corporation

TSI . . . . . Transportation Safety Institute, RSPA, U.S. DOT

U.S. DOT . . . . . U.S. Department of Transportation

U.S. HUD . . . . . U.S. Department of Housing and Urban Development

Volpe Center . . . . . John A. Volpe National Transportation Systems Center, RSPA, U.S. DOT

1. INTRODUCTION

1.1. BACKGROUND

Gas master meter systems are small intrastate gas distribution systems providing natural gas purchased from local gas utilities (or, rarely, gas transmission systems) to consumers in connection with the rental, leasing, or management of real property.[1] Gas master meter systems, of which there are thousands, operate in almost every state and supply natural gas for heating, cooking, and other uses to tens of thousands of homes and businesses. The systems can be found at a wide variety of locations, including trailer parks, public housing projects, shopping centers, and apartment complexes.

To ensure their safe operation, master meter systems, like other gas distribution systems, are regulated by the U.S. Department of Transportation's (U.S. DOT's) Office of Pipeline Safety (OPS) under the authority of Federal pipeline safety law.[2] Federal pipeline safety law allows states to assume responsibility for inspecting master meter systems and for enforcing the Federal regulations that apply to them by entering into cooperative agreements with the OPS. The OPS actively encourages states to do this by providing funds to states as an incentive under a Federal grant-in-aid program authorized by Federal pipeline safety law. As of the end of 1999, 42 states and the District of Columbia had assumed partial or full responsibility for their master meter systems. Inspection of the master meter systems in these states is the responsibility of the state pipeline safety authorities. Federal inspection, under OPS policy, is limited to systems not covered by state regulation and is conducted only when (1) an accident occurs, or (2) the OPS becomes aware of a safety concern.

The OPS and its state partners, as well as many others in government and the general public, have an abiding interest in ensuring the safety of the Nation's gas pipeline systems. A focus of that interest has been on the adequate inspection of gas pipeline system systems. Inspection is crucial to the efforts of safety regulators working to ensure that gas pipeline systems are being operated in a safe manner. Inspection gives safety regulators an opportunity to work with gas pipeline system operators to identify and correct problems before they can cause accidents, and this can be especially important for master meter systems.

There are a number of factors complicating the inspection of master meter systems. Arguably the most important is the large numbers of such systems. Currently, over eight thousand master meter systems are believed to be operating in the U.S. In contrast, probably less than 1,400 local natural gas

[1] In addition to natural gas master meter systems, it might be noted that there are also water, electricity, and Liquefied Petroleum Gas (LPG) master meter systems. For the purposes of this study, the term "master meter system" will refer to a natural gas master meter system, unless otherwise indicated.

[2] 49 U.S.C. 60101 et seq.

distribution companies are currently operating in the U.S.[3] It is difficult for state and Federal inspectors to visit such a large number of operating entities on a regular basis.

A second factor, closely rivaling the first in importance, is that there is no easy way of identifying master meter systems. Safety regulators frequently must rely on local gas utilities to identify master meter systems. In many cases, local gas utilities do not have or keep that type of information. Furthermore, master meter operators often do not realize that they are subject to gas safety regulations, so they cannot be relied upon to identify themselves.

A third factor complicating inspection is that master meter systems, unlike local gas utilities, are frequently operated and maintained by people who are not gas pipeline professionals and who have, at best, only a sketchy and vague understanding of the Federal safety standards for the distribution of natural gas by pipeline as set forth in Part 192 of Title 49 of the *Code of Federal Regulations*. Some master meter operators reportedly do not realize that the local gas utilities supplying them with gas are not responsible for the safety and maintenance of their systems. As a consequence, inspectors must often spend a disproportionate amount of time with master meter systems to ensure their safety.

1.2. PURPOSE OF THIS STUDY

The purpose of this study is to assess the need for an improved inspection program for master meter systems. This is the obvious first step in any effort to ensure the safe operation of master meter systems, since inspection is the primary means used to identify problems.

This study was mandated by Congress in Section 108(c) of the Pipeline Safety Reauthorization Act of 1988,[4] which directs the Secretary of Transportation to "...undertake a study to assess the need for an improved inspection program for master meter systems."[5] The Act also directs that a report detailing the findings of that study be submitted to Congress, along with any recommendations for appropriate legislation that the Secretary of Transportation may wish to make.[6]

Additionally, Section 108(a) of the Pipeline Safety Reauthorization Act of 1988, in part, mandates that the master meter systems for which the states have not assumed regulatory responsibility (i.e., the systems for which the OPS retains regulatory responsibility) be inspected at least once every two years, but gives the Secretary of Transportation the option of reducing the frequency of inspection. This study provides information that can be used to ascertain whether the frequency of inspection can be reduced without compromising the safety of master meter systems.

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[3]While master meter systems are local and distribute gas, they are not generally referred to or classed as "local distribution companies" or "local gas utilities."

[4]Public Law 100-561.

[5]See Section 108(c)(1).

[6]See Section 108(c)(2).

The focus of this study is on natural gas master meter systems. Liquefied petroleum gas (LPG) distribution systems are not considered. The OPS regards LPG systems, including LPG master meter systems, as a separate category of intrastate pipeline systems with somewhat different problems and concerns than natural gas master meter systems.

1.3. STRUCTURE OF THE REMAINDER OF THE REPORT

The remainder of this report is organized in the following manner. In Chapter 2, an overview of master meter systems is presented. Included in this chapter is a description of master meter systems, the definition of a master meter system contained in the Federal pipeline reporting requirements (49 CFR 191), an estimate of the number of systems currently in operation in the U.S., and an overview of the safety record of the systems. In Chapter 3, Federal and state regulation of the safety of master meter systems is surveyed. In Chapter 4, inspection and other activities undertaken by state and Federal pipeline safety regulators to ensure the safety of the systems are detailed. In Chapter 5, the need for improved inspection of master meter systems is examined. In Chapter 6, an alternative to an improved inspection program is reviewed and evaluated. Chapter 7 outlines the key findings of the report. Chapter 8 presents the report's recommendations. A selected bibliography listing the papers and publications used in preparing the report, a list of those contributing to the study, and three appendices conclude the report.

2. OVERVIEW OF MASTER METER SYSTEMS

2.1. INTRODUCTION

This chapter provides an overview of natural gas master meter systems. The purpose of the overview is to provide background information that will allow a better understanding of master meter systems and the associated safety concerns. In this chapter, master meter systems as a general concept and as defined in the Federal pipeline reporting requirements by the Office of Pipeline Safety (OPS) are described, salient information about master meter systems and their operation is presented, the number of master meter systems currently in operation is discussed, and the recent safety record of master meter systems is reviewed.

2.2. WHAT IS A MASTER METER SYSTEM?

A master meter system is a distribution system providing gas to consumers in conjunction with the rental, leasing, or management of real property.[7] Master meter systems usually purchase product from the local gas utility, although occasionally a master meter system's supplier may be a transmission system.[8] Master meter systems take their name from the "master meter" at the connection point between a master meter system and its supplier, which measures the amount of gas taken from the supplier by the system.[9]

A master meter system operator will either (1) sell the gas it purchases from its supplier directly to the consumer or (2) include the cost of the gas in the fee or charge assessed for the use of the real property by the consumer (for example, in rent or condominium fee). A master meter system may have sub-meters (i.e., meters for each consumer or for groups of consumers)[10] for measuring consumption and allocating costs. Sub-meters are banned in some states.[11]

Frequently, a master meter system obtains the gas that it distributes at a bulk rate discount. This discount will vary from utility to utility and from state to state, as well as over time, but it can be fairly substantial. In California in the early 1980s, for instance, Pacific Gas & Electric Co. was giving a 15

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[7]Some condominium associations, cooperatives, and similar entities operate master meter systems as one of the management services provided to their members.

[8]A gas transmission system is a gas pipeline system used to transport natural gas from oil/gas fields or gas processing plants (which are generally located near oil/gas fields) to local gas distribution utilities.

[9]Master meters system that are not sub-metered are sometimes referred to as "centrally metered installations."

[10]Sub-meters at public housing projects are sometimes referred to as "check meters".

[11]According to Seisler, p. 147, as of July 1978, 27 states had banned sub-meters. It is uncertain how this has changed since then.

percent discount to at least some master meter systems.[12] Some of the savings realized by a master meter system due to its purchase of gas at a bulk rate discount may be passed on to the system's customers. In some states, master meter systems are not allowed to charge final consumers more than was originally paid for the gas, and in those states the entire discount will be passed on.[13] This, of course, will tend to discourage potential master meter operators from entering the business, which may have a safety impact, as well as an economic impact. Furthermore, it can induce existing operators to leave the business, which may also have both safety and economic impacts.

Master meter systems provide gas at a variety of different types of facilities. These include public housing projects, trailer parks, colleges and universities, campgrounds, apartment buildings and complexes, shopping malls, industrial parks, motels, golf courses, medical facilities, and churches. The category with the most gas master meter systems is apartment buildings and complexes, followed by trailer parks and public housing projects.

2.3. A MASTER METER SYSTEM AS DEFINED BY THE OPS

The safety of natural gas master meter systems is regulated under the statutory authority given to the Secretary of Transportation by Federal pipeline safety law and delegated by the Secretary to the Office of Pipeline Safety (OPS). For purposes of its safety regulations, the OPS in 49 CFR §191.3 defines a gas master meter system as follows:

> *Master Meter System* means a pipeline system for distributing gas within, but not limited to, a definable area, such as a mobile home park, housing project, or apartment complex, where the operator purchases metered gas from an outside source for resale through a gas distribution pipeline system. The gas distribution pipeline system supplies the ultimate consumer who either purchases the gas directly through a meter or by other means, such as by rents.[14]

OPS policy is that the term "master meter system" applies only to gas distribution systems serving multiple buildings. It does not apply to gas distribution systems consisting entirely or primarily of interior piping located within a single building.[15] Such systems, however, may be referred to as master meter

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[12]U.S. DOT, "Exercise of Jurisdiction Over Master Meter Gas Operators," p. 24. The original source is cited as a letter from PG&E to Operators of Privately Owned Gas Distribution Systems in Mobile Home Parks, dated January 4, 1982.

[13]According to a telephone conversation on January 3, 2001, between Steve Pott, Colorado Public Utility Commission, and Paul Zebe, Volpe Center, this is the case currently in Colorado. In that state, the price that the master meter operator pays for gas is the maximum price that system customers can be charged. According to an e-mail on November 17, 2000, from Gary Hall, Kansas Corporation Commission, to Paul Zebe, Volpe Center, master meter operators in Kansas may not make a profit on the sale of natural gas.

[14]49 CFR §191.3.

[15]See U.S. DOT, "RSPA Responses to NAPSR Resolutions," pp. 115-116 (Note: NAPSR is the National Association of Pipeline Safety Representatives), which states, in part, that

systems by local utilities and utility regulators for rate purposes, as well as by some state gas pipeline safety regulators for safety regulation purposes.

Master meter systems consisting entirely or primarily of interior piping located within a single building are excluded by the OPS from its definition because

> ...such systems do not resemble the kinds of distribution systems to which Congress intended the Natural Gas Pipeline Safety Act to apply because of the absence of any significant amount of underground or external piping serving more than one building.[16]

In essence, the OPS regards such systems in the same way it regards the piping at a large commercial building or industrial plant.

It might be noted that it is OPS policy to exclude some piping in jurisdictional master meter systems (i.e., in master meter systems as defined by the OPS) from regulation.[17] Specifically, interior piping in buildings that is "downstream" from the customers' meters, or the start of customer piping if there is no sub-metering, is not regulated by the OPS.[18] Interior piping that is "upstream" from the customers' meters is subject to OPS regulation.[19]

2.4. SELECTED CHARACTERISTICS OF GAS MASTER METER SYSTEMS

A number of characteristics of master meter systems may impact the safety of the systems or the severity of consequences that would result if an accident occurred. Significant among these are the number of customers that a system serves, the length of underground or exterior piping, and system distribution pressure.

> Even though the present definition of 'master meter system' does not refer specifically to the existence of exterior piping serving multiple buildings, the reference to a 'pipeline system for distributing gas within...a mobile home park, housing project, or apartment complex' must involve the distribution of gas through exterior or underground pipelines to more than one building. The phrase regarding exterior piping serving multiple buildings was not considered essential since the use of exterior or underground pipelines to distribute gas to more than one building is implicit in the language of the definition.

This is a continuation of the policy adopted by the OPS prior to the publication of the regulatory definition of a master meter system. [See OPS Advisory Bulletin 73-10, October 1973, or the May 1973 letter from Joseph Caldwell, then Director of OPS, to Wayne Carlson, Public Service Commission of Utah.]

[16]U.S. DOT, "RSPA Responses to NAPSR Resolutions," p. 116.

[17]This policy is followed by regulators in some of the states that cooperate with the OPS in the regulation of master meter systems. Regulators in other states, such as Connecticut, report that they cannot follow the policy. State law in these states does not allow them to deviate from the Federal pipeline safety regulations.

[18]Telephone conversation between Jim Thomas, Regional Director, Southwest Region, Office of Pipeline Safety, U.S. DOT/RSPA, and Paul Zebe, Volpe Center, January 1990.

[19]U.S. DOT, "RSPA Responses to NAPSR Resolutions," p. 116.

2.4.1. The Number of Customers

A master meter system generally does not serve many customers.[20] For instance, in Maryland, a typical master meter system is reported to currently serve about 284 units (customers).[21] In Nevada, seven of the eight master meter systems in operation in that state are reported to have between approximately 100 and 275 customers.[22]

2.4.2. The Length of Underground Piping

The length of master meter system underground piping varies considerably. It is generally not very long, however. The average length of the underground or exterior piping for master meter systems currently operating in Maryland, for example, is 2,764 feet.[23] This is short when compared to the average length of the underground distribution main piping operated by local gas utilities. In the U.S. in 1995 there were, according to the National Association of Regulatory Utility Commissioners (NARUC), approximately 1,350 gas utility operations[24] and, according to the American Gas Association (AGA), 935,082 miles of gas utility distribution mains.[25] Based on these figures, a gas utility in the U.S. has, on average, about 693 miles of distribution mains.

2.4.3. The Distribution Pressure

In general, the distribution pressure of master meter systems is very low. In Colorado, for example, state pipeline safety regulators report that the pressure is generally two pounds or less in most systems.[26] In contrast, local gas utilities generally operate at much higher distribution pressures.

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[20]U.S. DOT, "Exercise of Jurisdiction Over Master Meter Gas Operators," p. 3.

[21]E-mail from John Clementson, Pipeline Safety Engineer, Maryland Public Service Commission, to Paul Zebe, Volpe Center, November 27, 2000.

[22]E-mail from Craig Steele, Nevada Public Service Commission, to Paul Zebe, Volpe Center, April 10, 2001.

[23]E-mail from John Clementson, Pipeline Safety Engineer, Maryland Public Service Commission, to Paul Zebe, Volpe Center, November 27, 2000.

[24]National Association of Regulatory Utility Commissioners (NARUC), *Utility Regulatory Policy in the United States and Canada, Compilation 1995-1996*, Washington, DC, 1996, Table 171, number of utilities by state. Some of the utilities operate in more than one state and therefore may have been counted more than once. Also, counts for some types of gas utilities in two states (Illinois and Nebraska) were unavailable, and counts of utilities in another two states (Alabama and New Jersey) were for prior years.

[25]AGA, *Gas Facts*, 1996 edition (1995 data), p. 27.

[26]Letter from Ernest Tronco, P.E., Gas Pipeline Safety Engineer, Colorado Public Utilities Commission, to Paul Zebe, Volpe Center, November 22, 1989.

Typically, the distribution pressure for a gas utility is 20 to 40 psig (pounds per square inch gauge).[27] The distribution pressure of master meter systems is also lower than the service line pressures found on

[27]Telephone conversation between Lloyd Ulrich, OPS, and Paul Zebe, Volpe Center, September 11, 1990.

many local gas utility systems. The typical pressure in a local gas utility high pressure service line is between 2 and 10 psig, although it can be considerably higher.[28]

2.5. THE NUMBER OF MASTER METER SYSTEMS CURRENTLY IN OPERATION

The exact number of jurisdictional master meter systems currently in operation in the U.S. is unknown. Exhibit 1 presents the best available information on the number of master meter systems in operation in the U.S. in 1999 by state. The information in the exhibit was obtained primarily from the annual submissions of state and other pipeline safety regulators to the OPS. Based on those submissions, there are at least seven thousand jurisdictional master meter systems currently operating in the U.S.[29] In total, there are approximately 8.4 thousand jurisdictional master meter systems presently in operation. This estimate was derived from the information contained in Exhibit 1.[30]

For some states, the number of systems given in Exhibit 1 is the number of systems with "appreciable" underground or exterior piping downstream of the master meter, while for other states additional master meter systems are included. Those with appreciable underground or exterior piping downstream of the master meter are, of course, those meeting the OPS's definition of a master meter system and, as a consequence, are covered by the Federal gas pipeline safety regulations. State pipeline safety regulations in some cases cover additional master meter systems not covered by the Federal regulations. The state of Washington is one example of a state that uses a broader definition of master meter systems than used by the OPS.[31] Utah is another example.[32]

For some states, the number of systems given in Exhibit 1 excludes some jurisdictional master meter systems because the jurisdiction of some state pipeline regulators is limited. For example, California pipeline safety regulators only have jurisdiction over master meter systems at mobile home parks,[33] while Missouri pipeline safety regulators do

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[28]E-mail from Lloyd Ulrich, OPS, to Paul Zebe, Volpe Center, March 20, 2001.

[29]This estimate was derived by summing the figures given in Exhibit 1 and rounding the result, 7,352, to the nearest thousand.

[30]Values are presented in Exhibit 1 for master meter systems in 44 (88 percent) of the states. Assuming that the states for which there are no values are not significantly different from those for which there are, then a total estimate can be calculated by dividing 7,352, the sum of the figures given in Exhibit 1, by 0.88. This simplistic estimation approach ignores Puerto Rico and DC, as well as any under- or overreporting by the states. Because underreporting is considered more likely than overreporting, the estimate probably understates the actual number of systems.

[31]Letter from Douglas Kilpatrick, P.E., Pipeline Safety Director, Washington Utilities and Transportation Commission, to Paul Zebe, Volpe Center, December 1, 2000.

[32]E-mail from Chris Hoidal, Regional Director, Western Region, Office of Pipeline Safety, U.S. DOT/RSPA, to Paul Zebe, Volpe Center, June 18, 2001.

[33]Telephone conversation between Mahendra Jhala, Chief, Utilities Safety Branch, California Public Service Commission, and Paul Zebe, Volpe Center, December 19, 2000.

EXHIBIT 1. NUMBER OF MASTER METER SYSTEMS IN OPERATION AS OF DECEMBER 31, 1999

State	Number	State/Other	Number
Alabama	93	Nebraska	2
Alaska	Unknown	Nevada	8
Arizona	1185	New Hampshire	3
Arkansas	200	New Jersey	57
California	2,704[a]	New Mexico	219
Colorado	45	New York	Unknown[d]
Connecticut	0	North Carolina	21
Delaware	8	North Dakota	11
Florida	13[b]	Ohio	49
Georgia	127	Oklahoma	168
Hawaii	Unknown	Oregon	3
Idaho	Unknown	Pennsylvania	Unknown
Illinois	22	Rhode Island	7
Indiana	52	South Carolina	8
Iowa	0	South Dakota	2
Kansas	28	Tennessee	59
Kentucky	106	Texas	776
Louisiana	147	Utah	472
Maine	0	Vermont	0
Maryland	62	Virginia	99[e]
Massachusetts	Unknown	Washington	258
Michigan	0	West Virginia	198
Minnesota	4	Wisconsin	circa 30
Mississippi	74	Wyoming	0[f]
Missouri	8[c]	D.C.	0
Montana	24	Puerto Rico	Unknown

Notes:

a. Only includes master meter systems at mobile home parks.
b. Jurisdiction extends only to the furthest meter downstream. For master meter systems without submetering, this will be the master meter.
c. Does not include master meter systems at public housing projects.
d. Local distribution companies are responsible for all underground gas facilities up to building wall.
e. Does not include master meter systems on Indian Reservations.

Sources of Information: Annual state/other agency filings with the Office of Pipeline Safety, U.S. Department of Transportation, and other information from state pipeline safety agencies.

not have jurisdiction over master meter systems operated by state housing authorities.[34] Additionally, some state pipeline safety regulators, such as those in Virginia, do not have jurisdiction over publicly owned utilities and by extension the master meter systems that they serve.[35]

Master meter systems on Indian Reservations fall outside the jurisdiction of state and Federal pipeline safety regulators,[36] except when those systems are operated by outside contractors, rather than by residents of the reservations.[37] The same applies to master meter systems on military bases and other military facilities.[38]

In 1979, there were an estimated 81 thousand natural gas master meter systems in operation in the U.S. This estimate was derived for the OPS by the Systems & Applied Sciences Corporation (SASC), based upon information obtained from gas utilities throughout the U.S.[39] SASC's estimates of the number of master meter systems by state are presented in Appendix A of this report.

With between 8 and 9 thousand master meter systems currently in operation, it appears that nearly 90 percent of all master meter systems in operation in 1979 have gone out of business.[40] The decline in the number of master meter systems since 1979 would appear, for the most part, to be the result of two factors. The first has been the desire of master meter system operators to make their gas customers accountable for the cost of the gas they consume. Master meter systems are often not sub-metered (as mentioned before, in many states this is illegal). When this is the case, consumers are not directly accountable for the cost of the gas they consume, but instead are only indirectly accountable through the rent paid to the landlord. Sometimes this can result in the landlord getting hurt financially, particularly when the price of gas is fairly volatile. Metering is needed to make the consumers accountable for the cost of the gas that they consume. The installation of sub-meters also costs money, however. To avoid this cost and to make the customers accountable, it appears some master meter system operators turned their systems over to their gas suppliers and went out of the gas

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[34]Telephone conversation between Michael Loethen, Missouri Public Service Commission, and Paul Zebe, Volpe Center, February 7, 2001.

[35]Annual submission of Virginia for 1999 to the Office of Pipeline Safety.

[36]E-mail from Jon Jacquot, Public Service Commission of Wyoming, to Paul Zebe, Volpe Center, March 21, 2001.

[37]E-mail from Warren Miller, Central District, Office of Pipeline Safety, RSPA/U.S. DOT, to Paul Zebe, Volpe Center, June 22, 2001.

[38]E-mail from Warren Miller, Central District, Office of Pipeline Safety, RSPA/U.S. DOT, to Paul Zebe, Volpe Center, June 22, 2001.

[39]SASC, *An Analysis of Natural Gas Master Meter Systems (Definition & Program) From A Federal Perspective.* The SASC estimate of 81 thousand does not include the number of master meter systems in Hawaii or New Jersey. SASC was unable to derive estimates for Hawaii and New Jersey because it received no usable data on the number of master meter systems when it surveyed the utilities in those states.

[40]It should be recognized that it is entirely possible the 81 thousand systems in existence in 1979 have all gone out of business, and the systems currently in operation are new systems that have started up since 1979.

distribution business.

The second factor contributing to the decline of master meter systems has been pressure applied on master meter operators and their gas suppliers by some state pipeline regulators, as well as by OPS regional personnel, to get (1) the operators to agree to turn their systems over to their suppliers and (2) the suppliers to agree to take over the systems from the operators. This has been an actively pursued goal of regulators in many states for years, and has reportedly been successful in many cases. The goal has been pursued primarily to help ensure the safety of those who obtain their gas from the master meter systems. This will be discussed in greater detail later in this report. Some of the pressure, it should be noted, has probably resulted from a concern by price regulators that master meter systems were charging their customers (or could potentially charge their customers) too much for natural gas.

2.6. THE SAFETY RECORD OF MASTER METER SYSTEMS

The safety record of master meter systems -- the violations of the Minimum Federal Safety Standards (i.e., 49 CFR Part 192) that are found during inspections and the historical incident record for the systems -- provides an indication of the types and magnitude of problems that master meter systems face.

2.6.1. Violations

Inspections of master meter systems by Federal and state inspectors often turn up violations of the Minimum Federal Safety Standards. Exhibit 2 identifies the most common violations and problems found by inspectors at master meter systems. As shown in the exhibit, there is considerable variation among the states with respect to the most common violations and problems found by pipeline safety inspectors. Problems relating to corrosion control, cathodic protection, leak surveys, emergency plans, and records preparation and maintenance are some of the more frequently cited violations.

Information on the numbers of violations and on the relative frequency of the types of violations found by inspectors is not readily available for the entire country. This information is available, however, for a few states.

With respect to numbers of violations, the situation in Arkansas may not be atypical. State pipeline regulators in Arkansas report an average of two violations per inspection.[41] This appears fairly consistent with the situation in other states. Kansas, for instance, has inspected an average of 33 master meter operators per year and has found an average of 79 violations per

[41]Letter from Don Martin, Chief of Pipeline Safety, Arkansas Public Service Commission, Utilities Division, to Paul Zebe, Volpe Center, Nov. 28, 2000.

EXHIBIT 2. THE MOST COMMON VIOLATIONS/PROBLEMS FOUND DURING INSPECTIONS OF MASTER METER SYSTEMS

State	Violations/Problems
Alabama	Low cathodic protection measurements
Alaska	No information
Arizona	Leak surveys, valve maintenance, mapping, training, odor checks, cathodic protection, atmospheric corrosion
Arkansas	§192.355--customer meters and regulators: protection from damage §192.463--External corrosion control: cathodic protection §192.615--Emergency plans §192.723--Distribution systems: leakage surveys §192.727--Abandonment or deactivation of facilities
California	No information
Colorado	No information
Connecticut	No master meter systems
Delaware	Mostly record maintenance related
Florida	Corrosion control and failure to lock meters where gas service has been interrupted or discontinued
Georgia	§192.465--External corrosion control: monitoring §192.723--Distribution systems: leakage surveys
Hawaii	No information
Idaho	No information
Illinois	No typical probable violation, but most problems are related to record keeping and the operator's knowledge of procedures
Indiana	Insufficient records to show compliance
Iowa	No master meter systems
Kansas	§192.465--External corrosion controls, monitoring §192.603--General provisions §192.615--Emergency plans §192.625--Odorization of gas §192.739--Pressure limiting and regulating stations: inspection and testing Kansas rules relating to leak surveys and valve maintenance
Kentucky	§192.721--Distribution system patrolling §192.727--Distribution valve maintenance §192.465--External corrosion controls, monitoring
Louisiana	Maximum allowable operating pressure, cathodic protection, and leak surveys
Maine	No master meter systems
Maryland	Key valves testing, hazards of gas notices, and emergency plan training

Massachusetts	No information

EXHIBIT 2. (CONT.)

State	Violations/Problems
Michigan	No master meter systems
Minnesota	Meter set support, Maxitrol regulators, emergency response liaison, emergency plan, operation and maintenance plan, external corrosion control, atmospheric corrosion control, public education, line marker and warning signs, and depth of cover
Mississippi	Leak repairs
Missouri	No information
Montana	Inspection program just getting established
Nebraska	Inadequate operations and maintenance manuals
Nevada	Inadequate operations and maintenance manuals, liaison with public officials, public education, cathodic protection
New Hampshire	Leak surveys, corrosion control, and education are problem areas
New Jersey	Cathodic protection O&M training
New Mexico	Updating O&M plans
New York	Inactive services
North Carolina	No major problems with master meter systems
North Dakota	No information
Ohio	O&M plan, emergency plan, leakage surveys, critical valve inspection, and mapping
Oklahoma	Lost O&M and records
Oregon	Cathodic protection, atmospheric corrosion, and various problems relating to O&M and emergency plans
Pennsylvania	Lack of operating and maintenance manuals, including record keeping as required under 49 CFR Part 192
Rhode Island	O&M plans, emergency plans, cathodic protection, leak surveys, atmospheric protection of aboveground piping, key valve maintenance
South Carolina	Only minor problems
South Dakota	Lack of written procedures and adequate record keeping
Tennessee	Leakage survey, cathodic protection, valve maintenance, record keeping
Texas	Repair and construction; design, installation, maintenance and inspection of pressure control equipment and corrosion facilities; testing; adequate operation, maintenance and emergency plans; establishing MAOP (maximum allowable operating pressure); maintenance and inspection tasks, such as patrolling, leak surveys, and inspection of valves
Utah	Inspection program just getting established
Vermont	No information

Virginia	Corrosion control procedures, monitoring, and records; O&M and emergency plans; MAOP; odorization; and leakage surveys

EXHIBIT 2. (CONT.)

State	Violations/Problems
Washington	O&M plans, emergency plans, mapping and records, leak surveys, aboveground pipe maintenance, cathodic protection, records, overpressure protection, odorization, valve maintenance, non-participation in a locator service
West Virginia	Written documentation and records, and maintenance
Wisconsin	Because most systems are only being inspected for the first time, few safety requirements are being fully met by operators
Wyoming	No master meter systems
D.C.	No master meter systems
Puerto Rico	No information

Sources of information: Various state regulatory agencies; OPS Eastern Regional Office; annual agency filings with the Office of Pipeline Safety, U.S. DOT.

year, or little over 2 violations per inspected operator.[42] Texas, which has performed 1,975 master meter system evaluations since January 1, 1995, has found a total of 5,627 violations, or an average of nearly 3 violations per evaluation.[43] Kentucky inspected 54 master meter operators in 1999[44] and found 59 violations,[45] an average of a little over 1 violation per inspected operator.

With respect to the relative frequency of the types of violations found during inspections, information is readily available for Arkansas and Maryland. The situations in Arkansas and Maryland, while in many ways similar, are by no means identical. This may be the result of a number of factors including the mix of types of master meter operators in the two states. For instance, master meter systems at trailer parks may be much more common in one state than the other, and master meter systems at trailer parks may typically experience a different set of problems than those found elsewhere. Another possibility is that the proportion of newly discovered master meter systems to previously identified systems may be different in the two states. Newly discovered systems would appear to be more likely to have problems than previously identified systems, all other things equal, because their operators are typically unacquainted with the requirements of the Minimum Federal Safety Standards.

In Arkansas from 1995 through 1999, state pipeline safety inspectors found 1,148 violations. Of those, 16 percent were related to leakage surveys, 13 percent were related emergency plans, 13 percent were related to cathodic protection for external corrosion, 12 percent were related to protection of meters from damage, 12 percent were related to abandonment or deactivation of facilities, 8 percent were related to general corrosion control, 8 percent were related to general atmospheric corrosion control, and the remaining 18 percent were related to a variety of other conditions.[46]

In Maryland from 1995 through 1999, 92 violations were found by state pipeline safety inspectors. Of those, 23 percent were related to testing key valves, 21 percent were related to hazards of gas notice, 17 percent were related to emergency plan training, 13 percent were related to checking corrosion protection readings, 11 percent were related to leak surveys, 5 percent were related to checking rectifiers, 3 percent were related to remedial action, 2 percent were related to lack of procedural manuals, 2 percent were related to service vents, 1 percent were related to retention of records, and 1 percent were related to condition of exposed pipe.

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[42]E-mail from Gary Hall, Kansas Commerce Commission, to Paul Zebe, Volpe Center, Nov. 17, 2000.

[43]E-mail from Mary McDaniel, Texas Railroad Commission, to Paul Zebe, Volpe Center, Jan. 19, 2001.

[44]Annual filing with the OPS for 1999 by the Kentucky Public Service Commission.

[45]Letter from Eddie B. Smith, Gas Branch, Division of Engineering, Kentucky Public Service Commission, to Paul Zebe, Volpe Center, Nov. 14, 2000.

[46]Letter from Don Martin, Chief of Pipeline Safety, Arkansas Public Service Commission, Utilities Division, to Paul Zebe, Volpe Center, Nov. 28, 2000.

2.6.2. The Incident Record

Information on the number of master meter system incidents is incomplete. This is mainly because master meter incidents are not always identified as such in incident reports and incident databases. As a consequence, incident information is available for the master meter systems in some, but not all, states. Exhibit 3 presents readily available information on master meter incidents from 1995 through 1999 that resulted in a death, a serious injury (i.e., one requiring a hospital stay), or property damage of $50,000 or more.

As shown in Exhibit 3, complete incident information is available for the five-year period for master meter systems in 37 states. In these 37 states during the five-year period, there were 2 master meter system incidents, which resulted in 2 injuries and over $200,000 of property damage. Of the 2 master meter incidents in the 37 states, 1 resulted from corrosion and 1 resulted from construction/operating error.

In comparison, the same 37 states during the same five-year period experienced 290 gas distribution system incidents, which resulted in a death, injury, or $50,000 or more in property damage. In total, those incidents resulted in 45 deaths, 218 injuries, and $53,165,561 in property damage. Of the 290 gas utility system incidents in the 37 states, 12 (or 4 percent) were the result of corrosion and 11 (or 4 percent) were construction/operating error. The remaining 267 (92 percent) were the result of damage by outside forces, accidentally caused by the operator, or the result of some other cause.[47]

[47]U.S. DOT, Office of Pipeline Safety, natural gas distribution incident data, Office of Pipeline Safety web site (ops.dot.gov), March 2001.

EXHIBIT 3. THE INCIDENT RECORD OF MASTER METER SYSTEMS, 1995-1999[a]

State	Incidents	Deaths	Injuries	Property Damage
Alabama	0	0	0	$0
Alaska	unk	unk	unk	unk
Arizona	0	0	0	$0
Arkansas	1[b]	0	0	>$100,000
California	unk	unk	unk	unk
Colorado	0	0	0	$0
Connecticut	na	na	na	na
Delaware	0	0	0	$0
Florida	0	0	0	$0
Georgia	0	0	0	$0
Hawaii	unk	unk	unk	unk
Idaho	unk	unk	unk	unk
Illinois	0	0	0	$0
Indiana	0	0	0	$0
Iowa	na	na	na	na
Kansas	0	0	0	$0
Kentucky	0	0	0	$0
Louisiana	0	0	0	$0
Maine[d]	na	na	na	na
Maryland	0	0	0	$0
Massachusetts	unk	unk	unk	unk
Michigan	na	na	na	na
Minnesota	0	0	0	$0
Mississippi	1[b]	0	1	>$100,000
Missouri	0	0	0	$0
Montana	0	0	0	$0
Nebraska	0	0	0	$0
Nevada	0	0	0	$0
New Hampshire	0	0	0	$0
New Jersey	0	0	0	$0
New Mexico	0	0	0	$0
New York	0	0	0	$0
North Carolina	0	0	0	$0

North Dakota	0	0	0	$0

EXHIBIT 3. (CONT.)

State	Incidents	Deaths	Injuries	Property Damage
Ohio	0	0	0	$0
Oklahoma	0	0	0	$0
Oregon	0	0	0	$0
Pennsylvania	unk	unk	unk	unk
Rhode Island	0	0	0	$0
South Carolina	0	0	0	$0
South Dakota	0	0	0	$0
Tennessee	0	0	0	$0
Texas	<10[b]	unk	unk	unk
Utah	0	0	0	$0
Vermont	0	0	0	$0
Virginia	0	0	0	$0
Washington	0[c]	0	0	$0
West Virginia	0	0	0	$0
Wisconsin[d]	na	na	na	na
Wyoming	na	na	na	na
D.C.	na	na	na	na
Puerto Rico	unk	unk	unk	unk

Key:

a Incident Definition: A release of gas from a pipeline and at least one of the following: (1) death, (2) injury requiring in-patient hospitalization, or (3) property damage valued at $50,000 or more.

b Incident causes: Arkansas--construction/operating error
Mississippi--external corrosion
Texas--various

c Known incidents; it is possible that incidents did occur during the time period. This may apply to incident information from other states, as well.

d Safety jurisdiction assumed between 1995 and 1999.

unk Unknown

na Not applicable--no gas master meter systems in operation during period

> Greater than

< Less than

Sources of information: State pipeline regulators; State filings with the U.S. Department of Transportation.

3. REGULATORY AUTHORITY OVER THE SAFETY OF MASTER METER SYSTEMS

3.1. INTRODUCTION

Regulatory authority over master meter systems is vested by the Federal pipeline safety law[48] with the U.S. Department of Transportation (U.S. DOT) and, by delegation, with the OPS. The law permits the states to assume jurisdiction and take responsibility for inspection and enforcement of intrastate pipeline systems, including master meter systems. The OPS actively encourages the states to assume jurisdiction over master meter systems because the OPS considers states "better equipped to inspect and otherwise deal with these localized gas distribution systems,"[49] and because it was never the intention of Congress or "the Federal approach to budgeting and resources" that the Federal government take permanent responsibility for intrastate distribution systems, including master meter systems.[50] The OPS exercises jurisdiction only over those master meter systems for which states have not assumed responsibility.

The reporting and safety requirements applicable to master meter systems are contained in Parts 191 and 192 of Title 49 of the *Code of Federal Regulations* (CFR). Part 191 details the incident reports required, while Part 192, the Minimum Federal Safety Standards, details the mandated minimum safety requirements that must be complied with by the systems. States that assume jurisdiction over master meter systems may impose safety standards that are more stringent than the Federal safety standards, but those standards must not be inconsistent with the Federal standards.[51] The safety and reporting requirements for master meter systems are similar, but not identical, to those for local gas distribution systems (i.e., local gas utilities).

Master meter systems, like local gas utilities, are required to do such things as provide training and written instruction for their staff, prepare written procedures to ensure the safe operation of the system and to "minimize the hazards resulting from natural gas pipeline emergencies," and keep records of inspection and testing.[52]

In addition, master meter operators, like gas distribution system operators, are required to develop written Operation and Maintenance (O&M) Plans. The provisions that these O&M plans must address are slightly different for master meter systems than for local gas utilities. Specifically, the odorization provision is different, and there are several other provisions that master meter operators

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[48]49 U.S.C. 60101 et seq.

[49]U.S. DOT, "Exercise of Jurisdiction Over Master Meter Gas Operators," p. 3.

[50]U.S. DOT, "Exercise of Jurisdiction Over Master Meter Gas Operators," p. 18.

[51]U.S. DOT, "Exercise of Jurisdiction Over Master Meter Gas Operators," p. 3.

[52]U.S. DOT, *Guidance Manual for Operators of Small Gas Systems*, p. I-1.

will probably not need to include in their plans because they address situations or conditions not generally found on master meter systems.[53]

In addition to an O&M Plan, master meter systems, like local gas distribution systems, must have written Emergency Plans that address emergency response procedures. The Emergency Plan may be included as part of the O&M Plan; however, this need not be the case. The provisions in the O&M and Emergency Plans must be consistent with Federal (and, where applicable, state) standards and requirements and with the actual procedures and practices of the system.[54]

Master meter operators are required to provide telephonic notification whenever there is a release of natural gas that results in a death, serious injury, or property damage of $50,000 or more, or that is considered significant by the operator. Unlike local gas distribution systems, they are not required to file annual reports or written incident reports with the OPS.[55] (State rules, however, may require that both be filed with the state.) They are also not required to develop written damage prevention programs.[56] (Again, state rules may require this.) In addition, employees of master meter systems are not subject to the drug testing requirements of 49 CFR Part 199.[57]

3.2. STATE EXERCISE OF JURISDICTION

States may assume jurisdiction over the master meter systems operating within their boundaries. To assume jurisdiction, a state agency must either (1) be annually certified by the U.S. DOT in accordance with Section 60105 of Title 49 of the U.S. Code[58] or (2) enter into an agreement with the U.S. DOT in accordance with Section 60106 of Title 49 of the U.S. Code.[59] The text of both of these sections can be found in Appendix B. States certified under Section 60105 take responsibility for both inspection and enforcement, while states under a Section 60106 agreement take responsibility for inspection and leave the responsibility for enforcement with the OPS.

States are encouraged by the OPS to assume jurisdiction over their master meter systems. The OPS provides the states with financial incentives to take responsibility for their pipeline systems through the

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[53]U.S. DOT, *Guidance Manual for Operators of Small Gas Systems*, pp. VIII-1 to VIII-21.

[54]U.S. DOT, *Guidance Manual for Operators of Small Gas Systems*, pp. VIII-1 to VIII-33.

[55]U.S. DOT, *Guidance Manual for Operators of Small Gas Systems*, pp. VIII-34, VIII-37.

[56]49 CFR 192.614(e)(1).

[57]U.S. DOT, *Guidance Manual for Operators of Small Gas Systems*, p. I-1.

[58]U.S. Code, Title 49, Section 60105, as amended.

[59]U.S. Code, Title 49, Section 60106, as amended.

State Pipeline Safety Grants program.[60]

At present, 43 states and the District of Columbia participate with the OPS in the regulation of the safety of master meter systems. Most states have assumed regulatory jurisdiction over master meter systems under Section 60105 certifications. Over the years, a few states have chosen to enter into 60106 agreements with the U.S. DOT. Currently, Delaware is the only state whose master meter system responsibility is covered by a 60106 agreement with the OPS. States can surrender jurisdictional authority if they so choose.

Exhibit 4 identifies those states that had regulatory jurisdiction as of December 31, 1999, along with the responsible state agencies. Exhibit 5 presents a map showing the states with and without jurisdiction. In addition, the map identifies those states in which there are no master meter systems.

To ensure that state inspection of pipeline facilities, including master meter systems, and state enforcement actions are both appropriate and adequate, the OPS, through its Regional Offices, regularly monitors the state pipeline safety programs. As part of this effort, the OPS annually reviews state inspection documentation (i.e., completed inspection forms and supporting documents) and enforcement actions. It also periodically observes state inspectors in the field. Any inspection or enforcement problems observed by the OPS are called to the attention of the inspectors or, where appropriate, the state regulatory agency.

To help ensure the quality of the state pipeline inspection program, the OPS requires that all state pipeline inspectors complete a nine to ten course training program over a three-year period at the U.S. Department of Transportation's Transportation Safety Institute (TSI) in Oklahoma City. The OPS also encourages the states to send their inspectors to TSI periodically for refresher courses to help them keep up with changes in pipeline regulations.

3.3. FEDERAL EXERCISE OF JURISDICTION

The OPS exercises jurisdiction over master meter systems only in cases where no state agency has assumed jurisdiction. Where it has jurisdiction, it is OPS policy to inspect master meter systems only when there has been an accident or when the OPS becomes aware of a safety concern.[61] The OPS can become aware of a safety concern through a variety of means, including complaints from members of the general public, reports of problems by state pipeline regulators, or observations made during previous inspections.

Currently, the OPS exercises full jurisdiction over master meter systems, if any, in Alaska, Hawaii, Idaho, Michigan, Vermont, Massachusetts, Pennsylvania, and Puerto Rico. It also is responsible for

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[60]See U.S. Code, Title 49, Section 60107, as amended.

[61]U.S. DOT, "Exercise of Jurisdiction Over Master Meter Gas Operators," p. 13; telephone conversation between Jeff Stahoviak, Western Regional Office, Office of Pipeline Safety, U.S. DOT/RSPA, and Paul Zebe, October 25, 2000.

enforcement activities in Delaware. In addition, the OPS is responsible in states

EXHIBIT 4. REGULATORY JURISDICTION OVER THE SAFETY OF MASTER METER SYSTEMS BY STATE AS OF DECEMBER 31, 1999

State	Jurisdiction?	Agency	State	Jurisdiction?	Agency
Alabama	Yes	PSC	Nebraska	Yes	SFM
Alaska	No	--	Nevada	Yes	PUC
Arizona	Yes	CC	New Hampshire	Yes	PUC
Arkansas	Yes	PSC	New Jersey	Yes	BPU
California	Yes	PUC	New Mexico	Yes	SCC
Colorado	Yes	PUC	New York	Yes	PSC
Connecticut	Yes	DPUC	North Carolina	Yes	UC
Delaware	Yes	PSC	North Dakota	Yes	PSC
Florida	Yes	PSC	Ohio	Yes	PUC
Georgia	Yes	PSC	Oklahoma	Yes	CC
Hawaii	No	--	Oregon	Yes	PUC
Idaho	No	--	Pennsylvania	No	--
Illinois	Yes	CC	Rhode Island	Yes	DPUC
Indiana	Yes	URC	South Carolina	Yes	PSC
Iowa	Yes	UB	South Dakota	Yes	PUC
Kansas	Yes	CC	Tennessee	Yes	RA
Kentucky	Yes	PSC	Texas	Yes	RRC
Louisiana	Yes	DNR	Utah	Yes	DC
Maine	Yes	PUC	Vermont	No	--
Maryland	Yes	PSC	Virginia	Yes	SCC
Massachusetts	No	--	Washington	Yes	UTC
Michigan	No	--	West Virginia	Yes	PSC
Minnesota	Yes	DPS	Wisconsin	Yes	PSC
Mississippi	Yes	PSC	Wyoming	Yes	PSC
Missouri	Yes	PSC	D.C.	Yes	PSC
Montana	Yes	PSC	Puerto Rico	No	--

Key:

BPU =Board of Public Utilities
BRC =Board of Regulatory Commissioners
CC =Corporation (or Commerce) Commission
DC =Department of Commerce
DNR =Department of Natural Resources
DPS =Department of Public Service (or Safety)
DPU =Department (or Division) of Public Utilities
DPUC =Department of Public Utility Control or Division of Public Utilities and Carriers
PSC = Public Service (or Safety) Commission
PUC = Public Utility(ies) Commission
RA = Regulatory Authority
RRC = Railroad Commission
SCC = State Corporation Commission
SFM = State Fire Marshal
UB = Utilities Board
UC = Utilities Commission
URC = Utility Regulatory Commission

UTC = Utilities and Transportation Commission

Sources of information: Various state agencies; state filings with OPS

Ozone Design Value Zones
Maximum 8-hour Ozone Design Value
Map Showing Ozone Design Value Zones
for Areas Designated Nonattainment
for the 1997 8-hour Ozone Standard

with Section 60105 certifications or Section 60106 agreements for master meter systems that those states do not oversee. For example, California state pipeline safety regulators only have responsibility for master meter systems at trailer parks, so the OPS is responsible for all other natural gas master meter systems in that state.[62]

Federal inspection and enforcement is undertaken primarily by the OPS's five Regional Offices. These offices, the Eastern, Southern, Central, Southwestern, and Western, are located in Washington, D.C.; Atlanta, Georgia; Kansas City, Missouri; Houston, Texas; and Lakewood, Colorado, respectively. Exhibit 6 lists the states served by each of the Regional Offices and Exhibit 7 presents a map of the OPS regions.

[62]E-mail from Lloyd Ulrich, Office of Pipeline Safety, RSPA/U.S. DOT, to Paul Zebe, Volpe Center, August 16, 2001.

EXHIBIT 6. STATES SERVED BY THE OPS REGIONAL OFFICES

Regional Office	States (and Others) Served
Eastern.....	Connecticut, Delaware, the District of Columbia, Maine, Maryland, Massachusetts, New Hampshire, New Jersey, New York, Pennsylvania, Rhode Island, Vermont, Virginia, and West Virginia
Southern.....	Alabama, Arkansas, Florida, Georgia, Kentucky, Mississippi, North Carolina, Puerto Rico, South Carolina, and Tennessee
Central.....	Iowa, Illinois, Indiana, Kansas, Michigan, Minnesota, Missouri, Nebraska, North Dakota, Ohio, South Dakota, and Wisconsin
Southwestern.....	Arizona, Louisiana, New Mexico, Oklahoma, and Texas
Western.....	Alaska, California, Colorado, Hawaii, Idaho, Montana, Nevada, Oregon, Utah, Washington, and Wyoming.

Figure 6. Time zones in the United States

4. ONGOING EFFORTS TO IMPROVE/ENSURE THE SAFETY OF MASTER METER SYSTEMS

4.1. INTRODUCTION

The states and the Federal government are currently engaged in a number of activities aimed at improving or ensuring the safety of master meter systems in the U.S. The primary activity undertaken to improve or ensure the safety of the systems is inspection. Other activities undertaken by regulators include identifying master meter systems, providing operators of master meter systems with training, encouraging master meter system operators to transfer their systems to gas suppliers, and encouraging gas suppliers to accept operational responsibility or ownership of master meter systems.

4.2. INSPECTION

Inspection is one method used by both Federal and state safety regulators to ensure and improve the safety of the master meter systems. Exhibit 8 provides information on the frequency of inspection of master meter systems by both Federal and state inspectors. Exhibit 9 is a map showing the frequency of master meter system inspection by state. The states are categorized according to the length of time between each inspection.

As shown in the two exhibits, in 19 states the frequency of inspection of master meter systems is at least once a year. Inspection occurs most frequently in Delaware, where state regulators report that they inspect several times a year. In seven states, the frequency of inspection is at least once every two years. Eight states inspect at least once every three years. Two states, Virginia and California, perform their inspections at intervals greater than three years. Six states and D.C. have no master meter systems. In two states, Montana and Utah, the responsibility for master meter systems has recently been assumed by state pipeline regulators, and regular inspection programs have not commenced. Georgia inspects systems consisting of steel pipe on an annual basis and inspects those consisting of plastic pipe less frequently. In all other states and in Puerto Rico, inspection is the responsibility of the OPS and is irregular.

It would seem that in those states with a greater frequency of inspection, safety would be enhanced and the number of incidents would be less. Unfortunately, it is not possible to test this hypothesis, because information on master meter system incidents is not adequate for that purpose.

The number of state inspections performed at master meter systems in 1999 is presented in Exhibit 10. Master meter systems are sometimes composed of multiple parts, or “inspection units.” This can occur when the system is large, or when the system has several discrete pieces that are not collocated. As shown in Exhibit 10, in 1999 a total of 3,092 master meter systems were inspected by the states. This appears to include multiple inspections of some

EXHIBIT 8. FREQUENCY OF INSPECTION OF MASTER METER SYSTEMS

State	Responsibility for Inspection	Frequency of Inspection
Alabama	State	Annually (at least)
Alaska	Federal	Irregular. No state inspection. Federal inspection in case of an incident, complaint, or OPS learns of a safety concern.
Arizona	State	Annual--Schools, child day care centers, retirement care centers, hospitals, churches, health care facilities, rehabilitation centers Biennial--Prisons, apartments, mobile home parks, RV centers, condos, businesses, campgrounds, industrial site, motels, hotels.
Arkansas	State	All master meter systems inspected at 12 to 24 month intervals
California	State	Less than once every three years, on average
Colorado	State	Annually
Connecticut	State	No master meter systems
Delaware	State	One to three times per year
Florida	State	Systems under PSC jurisdiction are evaluated annually. Systems not under direct PSC jurisdiction are required to be leak surveyed annually by the utilities supplying those systems with their natural gas.
Georgia	State	Systems with steel pipe may be inspected annually; systems that have all plastic pipe are inspected less frequently; based on annual reports to OPS,
Hawaii	Federal	Irregular. No state inspection. Federal inspection in case of an incident, complaint, or OPS learns of a safety concern.
Idaho	Federal	Irregular. No state inspection. Federal inspection in case of an incident, complaint, or OPS learns of a safety concern.
Illinois	State	Annually, on average
Indiana	State	Inspected annually
Iowa	State	No master meter systems
Kansas	State	Inspected annually
Kentucky	State	Inspections occur on a three-year cycle
Louisiana	State	At least once per year
Maine	State	No master meter systems
Maryland	State	Once every 15 months
Massachusetts	Federal	Irregular. No state inspection. Federal inspection in case of an incident, complaint, or OPS learns of a safety concern.
Michigan	Federal	No master meter systems
Minnesota	State	At least once each calendar year
Mississippi	State	Once per year

Missouri	State	Currently inspected annually

EXHIBIT 8. (CONT.)

State	Responsibility for Inspection	Frequency of Inspection
Montana	State	Not yet established
Nebraska	State	Once every two to three years
Nevada	State	Once every two years
New Hampshire	State	Once per year is goal
New Jersey	State	Once per year
New Mexico	State	At least once comprehensively every 36 months
New York	State	Annually or at least every other year
North Carolina	State	Inspected annually
North Dakota	State	Inspected annually
Ohio	State	Biennially
Oklahoma	State	Inspections occur on a one to three year cycle
Oregon	State	Try to inspect annually; maximum time allowed between inspections is three years; longest actual time between inspections is two years
Pennsylvania	Federal	Irregular. No state inspection. Federal inspection in case of an incident, complaint, or OPS learns of a safety concern.
Rhode Island	State	Once a year
South Carolina	State	Varies, but all sites are inspected at least once per year
South Dakota	State	Once each calendar year
Tennessee	State	Annually
Texas	State	Systems are scheduled for evaluation every three years
Utah	State	Not yet established
Vermont	Federal	No master meter systems
Virginia	State	Inspections are on a five year cycle
Washington	State	An average of 168 master meter system inspections per year have occurred in the past five years
West Virginia	State	Once every 2½ years or sooner if deemed necessary Newly recognized master meter systems inspected as soon as practicable after identification
Wisconsin	State	Once every three years
Wyoming	State	No master meter systems
D.C.	Local	No master meter systems
Puerto Rico	Federal	Irregular. No local inspection. Federal inspection in case of an incident, complaint, or OPS learns of a safety concern.

Sources of information: Various state agencies; annual agency filings with the Office of Pipeline Safety, U.S. DOT.

EXHIBIT 10. INSPECTIONS OF MASTER METER SYSTEMS IN 1999

State/Other	Number Inspected		State/Other	Number Inspected	
	Operators (% of Total)	Inspection Units (% of Total)*		Operators (% of Total)	Inspection Units (% of Total)*
Alabama	93 (100%)	111 (100%)	Nebraska	1 (50%)	1 (50%)
Alaska	0	0	Nevada	2 (25%)	2 (25%)
Arizona	816 (69%)	816 (69%)	New Hampshire	0 (0%)	0 (0%)
Arkansas	128 (64%)	230 (66%)	New Jersey	20 (35%)	31 (34%)
California	622 (23%)	622 (23%)	New Mexico	143 (65%)	181 (63%)
Colorado	40 (89%)	40 (89%)	New York	unk	unk
Connecticut	na	na	North Carolina	22 (104%)	22 (104%)
Delaware	8 (100%)	12 (100%)	North Dakota	11 (100%)	11 (100%)
Florida	13 (100%)	13 (100%)	Ohio	34 (69%)	54 (71%)
Georgia	50 (39%)	50 (39%)	Oklahoma	75 (44%)	75 (44%)
Hawaii	0	0	Oregon	0 (0%)	0 (0%)
Idaho	0	0	Pennsylvania	unk	unk
Illinois	17 (77%)	17 (77%)	Rhode Island	7 (100%)	7 (100%)
Indiana	52 (100%)	52 (100%)	South Carolina	8 (100%)	8 (100%)
Iowa	na	na	South Dakota	1 (50%)	1 (50%)
Kansas	27 (96%)	27 (96%)	Tennessee	59 (100%)	59 (100%)
Kentucky	54 (51%)	54 (51%)	Texas	286 (37%)	297 (35%)
Louisiana	145 (99%)	145 (99%)	Utah	23 (5%)	23 (5%)
Maine	na	na	Vermont	na	na
Maryland	53 (85%)	54 (86%)	Virginia	34 (34%)	69 (32%)
Massachusetts	0	0	Washington	60 (23%)	60 (23%)
Michigan	na	na	West Virginia	95 (48%)	147 (56%)
Minnesota	4 (100%)	4 (100%)	Wisconsin	circa 1 (3%)	circa 1 (3%)
Mississippi	67 (91%)	74 (93%)	Wyoming	na	na
Missouri	8 (100%)	8 (100%)	D.C.	na	na
Montana	13 (54%)	13 (54%)	Puerto Rico	0	0

Key:

unk = Unknown
na = Not applicable (no master meter systems)

Notes:

*Master meter systems, especially large ones, may be composed of more than one inspection unit.

Source: Annual state/other agency filings with the Office of Pipeline Safety, U.S. DOT.

master meter systems (see, for example, North Carolina in Exhibit 10). A total of 3,391 master meter inspection units were inspected in 1999. This figure appears to include multiple inspections of some inspection units.

4.3. OTHER ACTIVITIES

In addition to inspection, the Federal government and the states have undertaken a number of activities to help improve or ensure the safety of master meter systems. Exhibit 11 lists the major activities other than inspection undertaken by the various agencies of the Federal government and the states.

4.3.1. Other Activities Undertaken by the States

As shown in Exhibit 11, a number of states report that they train master meter operators, either formally or informally. This is probably the most common activity beyond inspection undertaken by the states to help improve or ensure the safety of master meter systems.

A number of states have formal training programs. Arizona, for example, annually provides master meter operators with a day of classroom training and a day of hands-on field training with various equipment. In addition, it has a program for master meter operators that will lend them equipment for use in leak surveys, corrosion control surveys, and pipe locating.[63] Illinois, unlike most other states, mandates formal training for everyone involved in the operation of gas systems, including master meter systems. Illinois state regulations stipulate, in some detail, the minimum requirements for the procedures used in the training of the operations personnel. The regulations allow master meter operators, as well as operators of other small gas systems, to use training programs conducted by local gas utilities, colleges and universities, consultants and others to obtain the required training. The section of the Illinois state regulations on training procedures is provided in Appendix C of this report.

In addition to formal training, information obtained from state pipeline regulators indicates that almost every state that inspects master meter systems provides some level of informal training during inspection. This is needed to ensure that system operators have some understanding of what is required of them and why. When North Carolina began regulating the safety of master meter systems, it found that the formal training it provided to operators had little effect on their performance. It found that the only way to get the operators to operate their systems in accordance with the Minimum Federal Safety Standards was to work with the operators during inspection.[64]

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[63]Attachment B with letter from Terry Fronterhouse, Chief of Pipeline Safety, Pipeline Safety Section, Arizona Corporation Commission, to Paul Zebe, Volpe Center, November 21, 2000.

[64]For more on the experience of North Carolina, see Dixon, "How North Carolina Solved Its Master Meter Problem."

EXHIBIT 11. ACTIVITIES BEYOND INSPECTION UNDERTAKEN TO IMPROVE THE SAFETY OF MASTER METER SYSTEMS

Agency	Activities
State/Local Agencies	
Alabama PSC	Conducts seminars Conducts workshops Encourages Alabama Line Location Center membership
Alaska	State has not assumed jurisdiction
Arizona CC	Conducts annual master meter seminars Has a program for master meter operators under which they can borrow equipment to use for leak surveys, corrosion control surveys, and pipe locating Arizona Administrative Code prohibits construction of new or expansion of existing permanent residential mobile home parks Encourages master meter operators to allow local distribution companies to install individual meters and take over their systems
Arkansas PSC	Provides training to new managers/owners of master meter systems (i.e., those with less than two years of experience) on the minimum safety standards Copies of all leak surveys and cathodic protection monitoring surveys must be submitted by master meter operators to the state for review. If reports indicate problems, proof of actions to rectify deficiencies must be submitted by master meter operators for review Local distribution utilities are forbidden by state regulations to supply service to "newly constructed"facilities through master meter systems, barring specific exemptions
California PSC	Local distribution companies have been encouraged to take over master meter systems
Colorado PUC	Emphasizes training Tries to encourage local distribution companies to absorb master meter systems
Connecticut PUC	Pressed local distribution companies to avoid creating new master meter situations
Delaware PSC	Regular pipeline safety educational seminars are offered locally or in conjunction with neighboring states Provides free updates of pipeline safety regulation booklets When practicable, owners of new master meter systems are informed in advance of the pipeline safety rules and regulations Encourages master meter operators to let the local distribution companies maintain their systems for compliance with safety regulations

EXHIBIT 11. (CONT.)

Agency	Activities
State/Local Agencies (Cont.)	
Florida PSC	Ensures that all master meter systems are members of the local one-call notification system New master meter systems are banned for investor-owned utilities New master meter systems are strongly discouraged for public gas systems For regulated utilities, new requirements have been added, including leak surveys for non-owned systems
Georgia PSC	Offers training for master meter operators to help with compliance with state and Federal regulations Assists with qualifications for plastic fusion welding Encourages local distribution companies to absorb master meter systems Encourages master meter systems to enter into maintenance contracts
Hawaii	State has not assumed jurisdiction
Idaho	State has not assumed jurisdiction
Illinois CC	Strongly encourages master meter operators to participate in educational and training programs sponsored by state agencies and industry associations/organizations Has encouraged local gas distribution companies to absorb the master meter systems that they serve
Indiana URC	Hosts bi-annual TSI seminar, which master meter operators are encouraged to attend Encourages master meter operators to attend the annual Purdue University Corrosion Short Course Inspectors work with and provide information to master meter operators, upon request. Recent activities in this area relate to educating master meter operators about the Operator Qualification rule and providing information to assist in compliance with the rule
Iowa	State does not allow master metering
Kansas CC	Engages in random drop-in visits throughout the year Currently has proposed regulation that master meter operators cannot make a profit on gas sales Currently has proposed regulation that new master meters will not be allowed

EXHIBIT 11. (CONT.)

Agency	Activities
State/Local Agencies (Cont.)	
Kentucky PSC	Works closely with the Kentucky Gas Association to encourage master meter operators to take advantage of the training opportunities offered through that organization Training sessions specifically for master meter systems Training sessions for all utilities, including master meter systems Encourages local distribution companies to absorb master meter systems
Louisiana DNR	Conducts two small operator/master meter operator seminars annually Performs operator training upon request
Maine	No master meter operators
Maryland PSC	Provides O&M manuals and emergency plans Provides emergency plan training Provides small operators' course triennially
Massachusetts	State has not assumed jurisdiction
Michigan	No master meter systems
Minnesota DPS	Master meter operators are invited to attend the annual Minnesota Office of Pipeline Safety Educational Conference Encourages local distribution companies to offer safety training to their master meter operators Newly identified master meter operators are encouraged to work with their local distribution companies for replacement and/or take-over by the local distribution companies Underground master meter facilities are listed in the Gopher State Once Call database for location and marking prior to planned excavation activities Existing master meter operators have arrangements with their local distribution company gas providers to perform most required safety functions
Mississippi PSC	Holds training seminars

Missouri PSC	Working with investor-owned utilities to systematically replace facilities of master meter systems using rates and tariffs of the utilities as the funding mechanism Local investor-owned distribution companies have been tasked with performing leak surveys for the master meter systems that they service. Some leaks that are found during those surveys are repaired by the local distribution company, which bills the master meter operator for the cost. Other leaks are left to the master meter operator to repair. In those cases, the operator has six months to complete the repairs.

EXHIBIT 11. (CONT.)

Agency	Activities
State/Local Agencies (Cont.)	
Montana PSC	Provides training in the requirements, such as operation and maintenance plans and emergency plans Encourages master meter operators to let their local distribution company take over their facilities
Nebraska SFM	Treats master meter operators exactly the same as any other gas system operator Will do occasional on-site training, if needed
Nevada PUC	Hosts a pipeline safety seminar every three years with a portion dedicated to small operators Maintains a list of qualified contractors for distribution to small operators if requested Inspectors often act as consultants to small operators Will encourage local distribution companies to absorb master meter systems that are unsafe or do not make any effort to comply with the safety codes
New Hampshire PUC	Encourages local distribution companies to perform operations and maintenance on system Strongly urges not installing a master meter system unless the local distribution company will be performing the operations and maintenance for the system
New Jersey BPU	Routinely corresponds with master meter operators to advise them of the requirement to file annual master meter compliance certifications Meets occasionally with local distribution companies to discuss ways of ensuring that the master meter operators they serve continue to perform master meter safety inspections State pipeline safety regulations ban new master meter systems When master meter operators have difficulty meeting their safety obligations, they are encouraged to meet with their local gas supplier to discuss available options, including turning the system over to the supplier
New Mexico SCC	Teach operators while inspecting, and advise operators when appropriate

New York PSC	The local gas distribution company is required to take total responsibility for all underground piping from gas mains to building walls regardless of where meters are located
North Carolina	Provides training for master meter operators Holds operator meetings to which master meter system operators are invited

EXHIBIT 11. (CONT.)

Agency	Activities
State/Local Agencies (Cont.)	
North Dakota PSC	All master meter operators are invited to an annual Federal/State gas pipeline safety seminar Provides assistance to any master meter operator needing help in writing or updating plans All O&M/Emergency Response Plans of master meter operators undergo a full review at least once every three years Efforts being made to encourage local distribution companies to absorb master meter systems Efforts are being made to limit new master meter systems
Ohio PUC	Hosts safety seminars throughout Ohio to educate master meter operators Has distributed copies of the *Guidance Manual for Operators of Small Natural Gas Systems* and of Parts 191 and 192 to master meter operators Has invited all master meter operators to their TSI seminars Encourages local distribution companies to take over master meter systems
Oklahoma CC	Holds two to three master meter seminars per year, which cover how to attain compliance with state and Federal regulations Works closely with local distribution companies to take over master meter systems

Oregon PUC	When staff is in the area, they try to take cathodic protection readings for master meter systems Encourages master meter operators to coordinate and communicate with the local distribution company Provides additional training, encourages operators to contact them with any questions they may have, and encourages operators to read the *Guidance Manual for Operators of Small Natural Gas Systems* Has made efforts to get local distribution companies to take over master meter systems Gets immediate notification from local distribution companies of any requests to become master meter operators, and meets with the requestors to explain the requirements of the pipeline safety regulations
Pennsylvania	State has not assumed jurisdiction

EXHIBIT 11. (CONT.)

Agency	Activities
State/Local Agencies (Cont.)	
Rhode Island DPUC	Provides Microsoft Powerpoint presentation on gas safety, compliance with the codes, and basic maintenance issues associated with gas master meter systems to the owners, management, and maintenance workers at each master meter facility Trying to get the one local distribution company with master meter customers to absorb all of them and have offered to have the expenses absorbed by the ratepayers in the interest of public safety
South Carolina PSC	Makes the same resources available to master meter operators as are available to other operators, including training, video tapes, publications, and visitations between inspections Has made efforts to get local distribution companies to absorb master meter systems
South Dakota PUC	Has adopted rules that generally prohibit the construction of new master meter systems. A variance is needed from the Commission before a new master meter system may begin operation

Tennessee RA	Sponsors gas pipeline safety seminars for master meter systems and small distribution system operators Encourages membership and participation in Tennessee Gas Association to promote education and training in natural gas operations Has recently conducted training on the Federal Operator Qualification (OQ) rule and on the guidelines for developing OQ plans Inspectors have informally encouraged master meter operators to consider transferring ownership to local distribution companies if the operators are unable to comply with all of the Minimum Federal Safety Standards
Texas RRC	Annually conducts seminars for pipeline operators, including master meter system operators Conducts special investigations to assist master meter operators in understanding applicable safety rules Has mandated that local distribution companies install and maintain over pressure equipment at master meter locations where ten or more consumers are served low pressure gas
Utah DPU	Hosts an annual seminar to which master meter operators are invited in order to refresh their knowledge of what is important concerning the safety of their systems Has an agreement with a local distribution company to limit new master meters to situations where individual meters would be impractical
Vermont	No master meter systems

EXHIBIT 11. (CONT.)

Agency	Activities
State/Local Agencies (Cont.)	
Virginia CC	Holds biennial pipeline safety seminars to which master meter operators are invited Is working with gas utilities in the state to develop training materials specifically designed for master meter operators. After these materials have been developed, it is planned that local seminars will be held at various locations around the state to train master meter operators. Encourages local distribution companies to work with the master meter systems they serve in order to help ensure the safe delivery of gas

Washington UTC	Uses a more stringent definition of master meter operators than the U.S. DOT's Office of Pipeline Safety Educates during inspection, walking the master meter operators through the process and assisting the operators in meeting compliance requirements Invites master meter operators to DOT-sponsored seminars Requires annual reporting of pipe inventory and cause of leaks Provides master meter operators with samples of plans, procedures, and forms Encourages master meter operators to replace their systems with an individually metered utility system
West Virginia PSC	Copies of *Guidance Manual for Operators of Small Natural Gas Systems* are provided during initial inspection of master meter systems (and sometimes during follow-ups), along with sample O&M plans and emergency plans Encourages master meter operators to contact Miss Utility of West Virginia, Inc., the local one-call notification system, about membership Has worked closely with some local distribution companies to encourage them to acquire master meter systems
Wisconsin PSC	Copies of *Guidance Manual for Operators of Small Natural Gas Systems* are provided to operators Copies of pipeline safety regulations are provided to operators Staff is currently in the process of creating a model O&M plan for master meter operators that will be made available for their use Encourages local distribution companies to acquire master meter systems Encourages master meter systems to allow their facilities to be taken over by local distribution companies
Wyoming	No jurisdictional master meter systems
D.C.	No master meter systems

EXHIBIT 11. (CONT.)

Agency	Activities
State/Local Agencies (Cont.)	
Puerto Rico	Commonwealth has not assumed jurisdiction
Federal Agencies	

U.S. Department of Transportation	Prepares, updates, and distributes the *Guidance Manual for Operators of Small Natural Gas Systems*. To facilitate and extend distribution, an electronic version of this manual has been made available on the Internet Holds, co-sponsors, and/or participates in training seminars for pipeline operators, including master meter operators, throughout the U.S. Some of these seminars are specifically designed to help small operators, such as master meter operators. Provides telephone help and assistance to pipeline operators, including small operators Works and participates with associations that support small operators Has developed a PowerPoint training presentation for in-house use by staff of small operators. This presentation can be downloaded from the Internet Offers participation to small operators, including master meter operators, in PEPG (Pipeline Employee Performance Group) training development meetings Prepares, updates, and distributes *Pipeline Safety Regulations*. Also makes regulations available on the Internet Encourages states that do not regulate master meter systems to seek authority to do so
U.S. Department of Housing and Urban Development	Various activities directed at helping to ensure the safety of master meter systems associated with public housing

Key:

BRC = Board of Regulatory Commissioners
CC = Corporation (or Commerce) Commission
DC = Department of Commerce
DNR = Department of Natural Resources
DPS = Department of Public Service
DPU = Department (or Division) of Public Utilities
DPUC = Department of Public Utility Control
UC = Utilities Commission
OPS = Office of Pipeline Safety
PSC = Public Service Commission
PUC = Public Utility(ies) Commission
PC = Railroad Commission
SCC = State Corporation Commission
SFM = State Fire Marshall
TSI = U.S. DOT/RSPA/Transportation Safety Institute
URC = Utility Regulatory Commission
UTC = Utilities and Transportation Commission

Sources of information: Various state agencies; OPS Regional Offices; TSI; state filings with OPS

A number of states attempt to (1) get master meter system operators to let their facilities be taken over by the local gas utilities supplying them, (2) get operators to have the maintenance or operation and maintenance of their systems be taken over by their gas suppliers, or (3) ban master meter systems.

Regulators in various states report that their agencies have made efforts to get the facilities of master meter systems taken over by the utilities supplying the systems with gas. These efforts have frequently met with success. In Connecticut, for example, due to the efforts of regulators, all existing master meter systems were phased out.[65] In Arizona, local gas distribution companies and state pipeline regulators have encouraged master meter operators to allow their gas suppliers to install individual meters. As a result of these efforts, approximately 350 master meter operators were eliminated in Arizona between 1995 and 2000.[66] In Missouri in 1984, state regulators worked with KPL Gas Service and got KPL to take over the facilities from a majority of the master meter systems at trailer parks in the KPL service area.[67] In the District of Columbia as a result of regulator activities, all master meter systems, as defined by the OPS, have been taken over by the local gas distribution company.[68] In Florida, new master meter systems have been banned for investor-owned utilities. New systems are strongly discouraged for public utilities. As a result, it is reported that no new master meter systems have been built in years.[69] In Michigan, as a result of Michigan Public Service Commission Cases U-4211 (April 29, 1974) and U-4985 (August 29, 1977), and a plan developed in 1992 in cooperation with utility representatives, "...the installation of centrally metered facilities has essentially been banned...."[70] In New Jersey, state pipeline safety regulations do not permit new master meter systems.[71]

Only one state, Iowa, has effectively banned master meter systems completely. Iowa state regulations do not permit master meters.[72] The regulations of the state require that

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[65]Letter from Philip Sher, Associate Engineer, Connecticut Department of Public Utility Control, to Paul Zebe, Volpe Center, December 18, 1989.

[66]Letter from Terry Fronterhouse, Chief of Pipeline Safety, Pipeline Safety Section, Arizona Corporation Commission, to Paul Zebe, Volpe Center, November 21, 2000.

[67]Letter from W.R. Ellis, Pipeline Safety Program Manager, Missouri Public Service Commission, to Paul Zebe, Volpe Center, December 4, 1989.

[68]Information from Richard C. Huriaux, P.E., Director, Office of Engineering, Public Service Commission of the District of Columbia, to Paul Zebe, Volpe Center, November 15, 1989, and subsequent information.

[69]E-mail from Edward Mills, Florida Public Service Commission, to Paul Zebe, Volpe Center, November 3, 2000.

[70]Letters from Ram Veerapaneni, Supervisor, Gas Operations, Michigan Public Service Commission, of December 1, 1989 and February 11, 1993 to U.S. DOT.

[71]E-mail from David McMillan, New Jersey Board of Public Utilities, to Paul Zebe, Volpe Center, December 4, 2000.

[72]Letter from Donald J. Stursma, P.E., Principal Gas & Water Engineer, Bureau of Rate & Safety Evaluation, Iowa State Utilities Board, to Paul Zebe, Volpe Center, November 15, 1989.

> All gas delivered to multi-occupancy premises where units are separately rented or owned shall be sold by a utility on the basis of individual meter measurement for each unit except for that gas used in centralized heating, cooling or water-heating systems, where individual metering is impractical, where a facility is designated for elderly or handicapped persons and utility costs constitute part of the operating cost and are not apportioned to individual tenants, or where submetering or resale of service was permitted prior to 1966.[73]

New York State, which permits master meter systems, requires that local gas utilities take responsibility for all underground piping from gas mains to building walls.[74] This effectively eliminates much of the risk associated with master meter systems.

4.3.2. Other Activities Undertaken by the Federal Government

The U.S. DOT has undertaken a number of activities to improve or ensure the safety of master meter systems, as can be seen in Exhibit 11. It periodically updates and distributes its *Guidance Manual for Operators of Small Gas Systems.* This manual was developed to provide a broad, general overview of the requirements of the Federal pipeline safety regulations for a non-technical audience. It covers reports and plans required by the OPS, the materials qualified for use in gas systems, construction and repair of systems, and the proper location and design of customer meters and service regulators.[75] It also provides the reader with a list of sources of additional information. The manual, last revised in 1997, has been widely distributed to master meter systems. A new update of the manual is currently being prepared. The 1997 version is currently available not only in hard copy, but also an electronic version of the manual is available on the Internet at www.tsi.dot.gov/divisions/pipeline/pipe_docs/som.htm.

The OPS Regional Offices provide some informal training to the master meter system operators with whom they come into contact in the course of inspecting master meter systems. The OPS Regional Offices are also active in sponsoring, participating in, and encouraging formal training seminars for master meter systems. They also encourage states that have not assumed master meter jurisdiction to do so.

The U.S. DOT's Transportation Safety Institute (TSI), which, like the OPS, is part of the Research and Special Programs Administration, is a key player in the formal training of master meter and other gas pipeline system operators. Each year it conducts training seminars and meetings in Oklahoma City, where it is located, and at many other sites throughout the country. Many states, as well as the OPS regional offices, sponsor TSI training seminars for gas pipeline system operators, including

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[73]Iowa Rules, 199-19.3(1)b.

[74]E-mail from Jeffrey Kline, Senior Valuation Engineer, Safety Section, Office of Gas & Water, New York State Department of Public Service to Paul Zebe, Volpe Center, November 6, 2000.

[75]A service regulator is "a device designed to reduce and limit the gas pressure to a consumer" [*Guidance Manual for Operators of Small Gas Systems*, p. A-4.].

master meter system operators.

Like the U.S. DOT, the U.S. Department of Housing and Urban Development (U.S. HUD), which is responsible at the Federal level for public housing in the U.S., also has an interest in the safety of master meter systems because many public housing projects in the U.S. are served by gas master meter systems. In the mid-1970s, U.S. HUD had Arthur D. Little, Inc., do a study "...to assess natural gas pipeline safety in residential areas served by master meters."[76] This study was used as the basis for a HUD master meter system safety guide entitled, *Handbook on Natural Gas Pipeline Safety in Residential Areas Served by Master Meters*, which was published in 1975.[77] The underlying purpose of this guide was

> ...to make housing project managers, maintenance engineering staff, and designers and architects of HUD-assisted and HUD-insured housing projects and mobile home parks aware of their responsibilities under the Natural Gas Pipeline Safety Act.[78]

The U.S. HUD guide was superseded by DOT's *Guidance Manual for Operators of Small Gas Systems*, which U.S. HUD has distributed in the past to public housing authorities around the country.[79]

U.S. HUD has operated a variety of programs over the years that could be used by public housing authorities to obtain funding to bring their master meter systems into compliance with the minimum Federal Safety Standards. Master meter operators in a number of states, including South Carolina, are reported to have availed themselves of U.S. HUD funding in order to finance system safety improvements.[80]

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[76]Arthur D. Little, Inc., *Natural Gas Pipeline Safety in Master-Metered Residential Areas*, p. iii.

[77]S. Atallah, P. Athens, D. Jeffreys, R. Linstrom, and J. O'Brien, *Handbook on Natural Gas Pipeline Safety in Residential Areas Served by Master Meters*.

[78]Atallah, S., Athens, P., Jeffreys, D., Linstrom, R., and O'Brien, J., *Handbook on Natural Gas Pipeline Safety in Residential Areas Served by Master Meters*, p. I.

[79]Telephone conversation between Charles Ashmore, HUD, and Paul Zebe, Volpe Center, January 11, 1990.

[80]Letter from James S. Stites, Chief, Gas Department, Utilities Division, South Carolina Public Service Commission, Paul Zebe, Volpe Center, November 14, 1989.

5. IMPROVING THE MASTER METER SYSTEM INSPECTION PROGRAM

5.1. INTRODUCTION

Inspection is one of the important activities undertaken by the states and the Office of Pipeline Safety (OPS) to ensure and improve the safety of master meter systems in the U.S. While other activities may have a potential for improving the safety of the systems (these will be discussed in the next chapter), none is currently as widely used as inspection.

When the states or the OPS send an inspector to a master meter system, the inspector almost always provides informal training in one form or another. The inspector may explain how to operate a pipe locator, or why it is important to periodically do leak surveys, or how to do a leak survey. In some cases, the inspector will sit down with the operator and review the regulations, explaining what the operator needs to do and how it is to be done. The training provided by inspectors is essential to the safe operation of master meter systems. In fact, in many cases it is the only gas pipeline safety training an operator receives.

Inspectors also help identify problems before those problems get worse. This is an important function of inspectors at any pipeline operation. It is an essential function at master meter systems, because the operators often may not recognize a problem and, if they do, often may not know how to correct it. When the OPS inspects and finds violations, it undertakes enforcement actions requiring the master meter system operator to take remedial action to bring the system into compliance with the Federal pipeline safety code. The states with Section 60105 certifications take similar actions when violations are found, while those with Section 60106 agreements refer enforcement actions to the OPS.

Master meter system operators, unlike the operators of most other types of gas pipeline systems, are not usually gas pipeline professionals. They are property owners, property managers, property maintenance people, and sometimes even janitors. They generally have little or no understanding of natural gas or how to handle it safely. It is reported, for instance, that one master meter operator was surprised to find that natural gas did not flow through the pipes as a liquid.[81]

It is evident from the foregoing that inspection is quite important to the safety of master meter systems. Given its importance, the question arises as to whether the current Federal/state cooperative program of inspection is sufficient, and, if not, how it might be improved.

5.2. IS THERE A NEED FOR AN IMPROVED INSPECTION PROGRAM?

The need for an improved inspection program would logically appear to hinge on the historical safety performance of master meter systems. If the performance has been good and there is no reason to assume that it will change in the future, then there is no need for an improved inspection program. If

[81]Dixon, "How North Carolina Solved Its Master Meter Problem," p. 26.

the performance is poor or there is some compelling reason to believe that today's good performance will deteriorate in the future, then an improved inspection program might be in order. Unfortunately, the data available on master meter incidents (see Exhibit 3) is too sparse to support an analysis to make such a determination. Furthermore, the data that exists is mostly from states with active master meter inspection programs, limiting its usefulness in any determination of the impact of an improved inspection program on the safety of master meter systems in states without such programs.[82] Little data exists for those states without active master meter inspection programs.

Because OPS policy in the states where it exercises jurisdiction is to inspect only when there is an accident or a safety concern, it might be assumed that OPS inspections conducted following incidents could be counted and used to bolster the available state incident data. Unfortunately, it is not clear that the OPS is notified of all master meter incidents where it exercises jurisdiction. Many master meter operators may not know that they are supposed to report accidents. Others may know that they are supposed to report, but not how or to whom, and still others may simply ignore the requirement for various reasons (this may also be true in some of the states where state agencies have assumed jurisdiction). In the 1970s and early 1980s when the OPS required annual reporting by all master meter operators, only an estimated 1.5 to 2.3 percent ever filed a report.[83] Although this experience may not necessarily be reflective of the experience of the OPS with the reporting of master meter system incidents, it is indicative of the possibility of under-reporting.

Although there is a paucity of master meter accident data, there are some indications of the relative performance of master meter systems. Many regulators have found from their experience that master meter system operators, unlike the operators of other gas distribution systems, are generally inadequately trained to safely operate and maintain their systems. Consequently, the potential for problems is considered greater on master meter systems than on other distribution systems. It should be noted that the opinion that master meter systems are not as safe as other systems is not universal. Pipeline regulators in several states have reported that the safety of master meter systems in their states is no worse than that of any other distribution system.[84]

One way to assess the adequacy of the current regime of master meter system inspection (and thereby assess the need for an improved inspection program) without accident data would be to compare the frequency of master meter system inspection with the frequency of inspection of similar types of pipeline systems, such as other gas distribution systems. The frequency of inspection that is needed for a particular type of system will depend, to a greater or lesser extent, on the risk of an accident (i.e., the probability of an accident times its expected consequences). Consequently, comparing the relative risk of accidents on master meter systems with that of accidents on other gas distribution systems

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[82]Of the 37 states with master meter systems for which incident data is provided in Exhibit 3, 20 inspect master meter systems at least once a year, 8 inspect them at least once every two years, and 7 inspect less frequently than biennially. Two of the states have not yet established an inspection schedule.

[83]U.S. DOT, "Exercise of Jurisdiction Over Master Meter Gas Operators," p. 9.

[84]Letter from Myron Thompson, Chief, Pipeline Safety, Arkansas Public Service Commission, to Paul Zebe, Volpe Center, December 1, 1989; letter from R. Lynnard Tessner, Georgia Public Service Commission, to Paul Zebe, Volpe Center, December 5, 1989.

would provide some indication of the frequency of inspection needed for master meter systems. To perform this comparison, it is necessary to look at the relative probabilities of accidents on the two types of systems and the relative consequences of accidents.

If master meter systems are less safe than other gas distribution systems, the probability of a master meter accident will be greater than that of an accident on other gas distribution systems. If master meter systems are no less safe than other gas distribution systems, the probability of a master meter accident will be about the same as that of an accident on other gas distribution systems. In the absence of good data, the probability of an accident on a master meter system can be expected to be greater than or equal to the probability of an accident on other gas distribution systems.

Master meter systems often serve mobile home parks, public housing authorities, apartment complexes, and other locations where there are concentrations of people. Many other gas distribution systems also serve concentrations of people. The concentrations of people served by master meter systems are almost certainly no less dense than the concentrations of people served by other gas distribution systems, and they may be denser. Consequently, the consequences of an accident on a master meter system will be no less than those of an accident on some other gas distribution system. This assumes that (1) accidents on other gas distribution systems are no more damaging than accidents on master meter systems and (2) property in the vicinity of accidents on master meter systems is no less valuable than property in the vicinity of accidents on other gas distribution systems.

Based on the foregoing, it would appear that the risk of an accident on a master meter system will be no less than that of an accident on other gas distribution systems, and, in fact, it may be greater. Therefore, based on comparative risk, it would appear that inspections of master meter systems should be no less frequent than inspections of other gas distribution systems. It may be, of course, that inspections should be more frequent.

Under Section 108(a) of the Pipeline Safety Reauthorization Act of 1988, if necessary funds are appropriated, the OPS is required to inspect all gas distribution systems over which it exercises jurisdiction at least once every two years. The OPS is permitted to inspect master meter systems at a reduced frequency, should this be considered appropriate. If two years is taken as the maximum acceptable interval between inspections, then master meter systems in at least 15 states are not being inspected often enough (see Exhibits 8 and 9). In 5 of those states -- Alaska, Hawaii, Idaho, Massachusetts, and Pennsylvania -- inspection is solely the responsibility of the OPS. In the others -- California, Kentucky, Nebraska, New Mexico, Oklahoma, Oregon, Texas, Virginia, West Virginia, and Wisconsin -- inspection is performed by the state.

5.3. PROBLEMS TO BE OVERCOME IN IMPLEMENTING AN IMPROVED INSPECTION PROGRAM

If an improved inspection program that increases the frequency of inspection of master meter systems is implemented, it will require the participation of pipeline regulators in every state. This will be necessary because (1) the states are better equipped to deal with local distribution systems and (2) the OPS does not have resources to take responsibility for inspection of the master meter systems. Undertaking improvement of master meter system inspection at the state level, however, will require overcoming several potential problems.

5.3.1. Getting States to Assume Jurisdiction Over Their Master Meter Systems

An improved master meter inspection program will necessitate that all states assume safety jurisdiction for their master meter systems. Currently, the states of Alaska, Hawaii, Idaho, Massachusetts, and Pennsylvania, as well as the Commonwealth of Puerto Rico, do not regulate master meter systems and cannot say definitively that they have no natural gas master meter systems. Michigan also does not regulate master meter systems, but that state eliminated them prior to giving up jurisdiction. Vermont does not regulate master meter systems, but does not have any.

It is reported that the most common reason why state regulators do not regulate master meter systems is that they have not been given the statutory authority to do so, and, as a matter of policy, generally do not seek to expand their authority. Furthermore, regulating master meter systems would require additional staff and most do not have a funding mechanism. It should be noted that most of these state regulators are not against regulating master meters. If legislation were introduced giving them authority over master meter system safety, they would generally not oppose it.[85]

The situation in California may not be atypical with regard to expansion of regulatory authority. California currently only regulates master meter systems at mobile home parks. California regulators report that they would need to show the state legislature the benefits of expanded regulation before the legislature would approve an expansion. Currently, they feel that they are incapable of doing so because they lack hard data on master meter system incidents and consequences at sites in California other than mobile home parks.[86]

5.3.2. Getting States to Increase Inspection Frequency

Getting states to increase the frequency of master meter inspection may require action by state legislatures to approve funding and increased numbers of safety inspectors, and will definitely require action by state safety agencies to undertake and allocate funding to support increased numbers of

[85]E-mail from William Gute, Regional Director, Eastern Region, Office of Pipeline Safety, RSPA/U.S. DOT, to Paul Zebe, Volpe Center, June 19, 2001.

[86]Telephone conversation between Mahendra Jhala, Chief, Utilities Safety Branch, California Public Service Commission, and Paul Zebe, Volpe Center, December 19, 2000.

inspections per year. In some cases, this might require convincing state legislatures and regulators that increased inspection frequency would be beneficial. The total cost of increased inspection to the states that inspect less frequently than biennially would appear fairly low, even when including the states that do not currently regulate master meter system safety.

Assuming that all existing state pipeline inspectors are now fully employed, undertaking at least biennial master meter inspections for the master meter systems by state agencies will involve the hiring of additional inspection staff. If a state has no pipeline safety jurisdiction whatsoever, new offices may need to be created that would include not only inspectors but also managerial and clerical staff. The average annual salary, as of December 31, 1995, of the full-time gas safety inspectors employed by the states participating in the gas pipeline safety program, according to the National Association of Regulatory Utility Commissioners, ranged from $16,000 in Vermont to $62,304 in Colorado.[87] After overhead and other costs are added to the salaries, the cost of hiring an inspector can be substantial. In some states, such as California, where the number of master meter systems unregulated by the state is probably quite large, several new hires might be required.

On the basis of master meter systems being inspected at least once every two years, it is quite possible that it would be necessary to perform 1,000 to 1,500 additional master meter inspections per year.[88] Those inspections would be distributed across 14 different states, plus Puerto Rico (these are where inspection occurs less frequently than once every two years). To perform those inspections, a total of about 28 to 50 additional inspectors would be needed. This estimate of the number of additional inspectors needed assumes that (1) the state or commonwealth undertakes to perform all needed inspections, (2) all state pipeline inspectors are currently fully employed (i.e., they have no free time to do any additional inspections), and (3) an inspector can be expected perform between 30 and 36 inspections, on average, per year.[89]

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[87]NARUC, *Utility Regulatory Policy in the United States and Canada, Compilation 1995-1996,* Washington, DC, 1996, Table 297.

[88]This was range was derived as follows. Currently, there are 7,342 known master meter systems. It is estimated that there are 8,343 master meter systems in total. This means that 1,001 systems additional systems would need to be inspected once every two years, or 501 additional systems would need to be inspected per year. Also, the frequency of inspection would need to be increased in California, Kentucky, Nebraska, New Mexico, Oklahoma, Texas, Virginia, West Virginia, and Wisconsin (see Exhibit 8). If these states were to inspect biennially, then a total of 716 more systems would need to be inspected annually (to be conservative, where a range was given in Exhibit 8, the longest time between inspections was used in the calculations that were made). Adding 501 and 716 yields 1,217 more systems to be inspected each year. Assuming the information in Exhibit 10 is representative of the relationship between systems and inspection units, then 1,325 additional inspection units would need to be inspected per year. One inspection per inspection unit was assumed. To be conservative, a general (non-statistical) range was used, rather than the point estimate of 1,325.

[89]In 1996, a recent year for which data is readily available, 294 inspectors working a total of 272 labor years inspected 8,107 natural gas inspection units (see U.S. DOT, "Report on Pipeline Safety, Calendar Years 1995-1996", p. 44). This is an average of 29.8 inspections per labor year. In 1995, 288 inspectors working a total of 234.79 labor years inspected 8,435 natural gas inspection units (see U.S. DOT, "Report on Pipeline Safety, Calendar Years 1995-1996", p. 42). This is an average of 35.9 inspections per labor year.

To put the number of additional inspectors into perspective, in 1996 there were 294 state inspectors involved with natural gas safety. An additional 28 to 50 would represent a 10 to 17 percent increase in the total number of inspectors. It would, of course, represent an even greater percentage of the number of inspectors employed by the states where the inspection frequency falls short of once every 2 years. If it is assumed that the total cost of a state pipeline inspector, including salary and benefits and direct support costs (e.g., travel, training, and equipment) is $50,000 per year, on average, then the additional inspectors will cost the states and commonwealths between $1,400,000 and $2,500,000 per year (not including any associated management, administrative, and legal costs). Spread among 14 states plus Puerto Rico, this is not an enormous amount of money. Assuming that the total cost is $100,000 per year per inspector, the total cost, which is between $2.8 million and $5 million, still does not appear excessive when spread among 14 states and Puerto Rico. Of course, this total cost will not necessarily be borne equally by all of the states, and the additional amount required could be viewed as burdensome by some state legislatures or regulatory agencies.

One impediment to states assuming jurisdiction may be industry resistance. Although the California Public Service Commission now has jurisdiction over master meter systems at mobile home parks, it is reported that the mobile home industry was instrumental in blocking some legislation that would have given the PSC that jurisdiction at an earlier date.[90] Resistance by industry, where it exists, is probably the result, in great measure, of a fear that changes in safety regulation will result in additional costs that will have to be borne by industry.

5.3.3. Identifying Master Meter Systems

Whenever jurisdiction is obtained, one of the first tasks facing state agencies is that of identifying the master meter systems operating in the state. This is not necessarily a simple process. It can prove to be both time-consuming and expensive if it requires an on-site inspection to determine whether a purchaser of gas is operating a master meter system. This is often the case, because local gas utilities, the primary source of information, will not always have sufficiently detailed records to determine if a system is a master meter system as defined by the OPS.[91]

In 1988-89, the Minnesota Office of Pipeline Safety (MN OPS) began a program to identify all of the master meter systems in the state. As a first step, the OPS asked all the utilities in Minnesota for the names of everyone who purchased gas for redistribution. Unfortunately, the information gathered was inadequate, and site visits by OPS staff were necessary.[92]

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[90]Telephone conversation with Al Kirchem, California Public Service Commission, March 9, 1990.

[91]SASC, *An Analysis of Natural Gas Master Meter Systems (Definition & Program) From A Federal Perspective,* p. 5-10.

[92]Telephone conversation with Ronald Wiest, MN OPS, March 6, 1990; Telephone conversation with Ronald Wiest, Steven Sweeney, and Scott Olsen, MN OPS, March 7, 1990; letter from Walt Kelly, Director, MN OPS, to RSPA, February 12, 1993.

In Ohio, the original list of potential master meter operators was 550. This was reduced by the Ohio Public Utilities Commission (OH PUC) staff to 295. Then, in 1989, an additional 850 potential operators were found. By the end of 1992 the number of identified master meter systems was 149, with a list of 596 potential ones remaining for the OH PUC to investigate.

5.3.4. Obtaining Sufficient Inspectors to Perform the Inspections

To perform additional inspections, some state regulatory agencies will undoubtedly need to hire additional inspectors. This may present some problems, at least in the short-term, since the number of individuals who are both qualified and willing to be inspectors is not unlimited. The problem appears to be that salaries paid by the state pipeline safety agencies are often too low to attract many people who are qualified.

From time to time, state pipeline safety agencies report that they come under a hiring freezes and are not permitted to hire inspectors. This could prove to be a problem if, after assuming jurisdiction, the state agencies find that they have a relatively large number of master meter systems to inspect. Although it is likely that a hiring freeze would be relaxed if the additional responsibility (i.e., the need to inspect master meter systems) considerably increased the workload of an agency, this is not certain. If the hiring freeze were not relaxed, it is likely that master meter system inspection by the state, though officially authorized, would not get underway (i.e., the state would probably not cut back on its other inspection programs to accommodate master meter system inspection). The same kind of problem would result if state agencies are not under a hiring freeze but are turned down when they seek permission to hire the additional inspectors needed.

5.4. OPERATOR QUALIFICATION AND MASTER METER SYSTEMS

In 1999, the Office of Pipeline Safety issued a final rule requiring "...pipeline operators to develop and maintain a written qualification plan for individuals performing covered tasks on pipeline facilities." This new rule, which is currently being phased in, covers master meter operators, along with most other hazardous liquid and gas pipeline operators. The rule is expected to "...ensure a qualified work force and...reduce the probability and consequence of incidents caused by human error."[93]

This rule to some extent represents an alternative to an improved program master meter system inspection.[94] It is expected by both Federal and state pipeline safety regulators that the new Operator Qualification rule will improve the safety performance of master meter systems by forcing master meter operators to do one of the following: (1) hire qualified staff, (2) hire qualified contractors, or (3) turn their operations over to the local gas distribution systems and get out of the gas distribution business. In some cases, it might be noted, to meet the requirements of the Operator Qualification rule, master

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[93] *Federal Register*, August 27, 1999, Vol. 64, No. 166, pp. 46853-46867.

[94] E-mail from Frederick A. Joyner, Regional Director, Southern Region, Office of Pipeline Safety, RSPA/U.S. DOT, to Paul Zebe, Volpe Center, May 24, 2001.

meter operators are likely to hire their local gas distribution companies.

In some cases, the new Operator Qualification rule may indeed obviate the need for an improved program of master meter system inspection. It will not do so, however, in all cases. There are master meter operators who do not currently understand what their responsibilities are with respect to ensuring the safety of their systems, and as a consequence do not perform those functions in an appropriate (and safe) manner. There is some question as to whether the Operator Qualification rule will have much of an impact on those operators, unless state or Federal pipeline regulators force the issue. Its impact on operators not currently subject to regular inspection is problematic, and arguably it is these very same operators who need the rule the most.

6. AN ALTERNATIVE TO AN IMPROVED INSPECTION PROGRAM

6.1. INTRODUCTION

A problem with inspection of master meter systems is that the gains in safety made by additional inspections are often temporary. As discussed earlier, persons who operate master meter systems are generally not qualified gas pipeline professionals. The training provided during inspection helps make those who operate master meter systems better able to run their systems safely. Unfortunately, there is a high turnover of people working at master meter systems (which, in large part, appears to be the result of low wages). It is reported that in Arkansas, for example, an inspector often deals with a different person every time a system is contacted.[95] When individuals who have received training from inspectors leave, they take their training and gas pipeline "experience" with them. It is lost to the master meter system. Important records may also be lost.[96]

The goal to improve the safety of master meter systems may not necessarily involve improving their inspection by Federal or state personnel. Since local gas utilities have qualified gas pipeline professionals, an alternative would be to turn responsibility for master meter systems over to the local gas utility companies. This alternative, which can be accomplished in three different ways, is discussed in the remainder of this chapter.

6.2. BAN MASTER METER SYSTEMS

One way to get local gas utility companies to assume the responsibility for master meter systems would be to ban master meter systems. This would effectively eliminate any safety problems associated with the distribution of natural gas by master meter systems. It would, of course, also eliminate the need for the inspection of master meter systems.

A ban on master meter systems would force the transfer of gas customers from master meter systems to local gas utilities (provided, of course, that the master meter systems did not circumvent the ban by switching to another fuel, such as propane). Utilities may require that landlords who formerly operated master meter systems pay a portion of the cost of hooking their tenants up to the gas distribution system (the portion may be as high as 100 percent). This charge should be no greater than what it would be for hooking up a new property of comparable size. Landlords may be able to recoup part of their costs by selling or transferring the facilities of their master meter systems to the gas utilities, though many utilities would not be interested in the underground piping of systems unless they are able to verify that it is in compliance with the Minimum Federal Safety Standards. To ensure that landlords get fair prices for the facilities they transfer to utilities, it may be necessary for state regulators to

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[95]Letter from Myron Thompson, Chief, Pipeline Safety, Arkansas Public Service Commission, to Paul Zebe, Volpe Center, December 1, 1989.

[96]Letter from Myron Thompson, Chief, Pipeline Safety, Arkansas Public Service Commission, to Paul Zebe, Volpe Center, December 1, 1989.

establish pricing guidelines.

Only one state, Iowa, has effectively banned all gas master meter systems. Three other states, Arkansas, Michigan, and New Jersey, have banned all new master meter systems. Existing systems in these states, however, are not affected by the ban and may continue to operate (no systems operate in Michigan any longer due to the restrictions imposed on them by the Michigan Public Service Commission in its Order in Case No. U-421 and to the state's 1992 requirement that local gas utilities offer to take master meter systems over).[97] By making the local gas utility responsible for underground piping up to the building wall, New York State's regulations apparently have had the effect of discouraging the establishment of new master meter systems and the continued operation of existing systems.[98]

Some state governments, it should be noted, appear to be opposed to expanding the regulatory control that they currently exercise over master meter systems. Regulators in at least one state, Texas, feel that their state government would be opposed to any additional governmental interference in the operation of master meter systems.[99] This, of course, means that the state government would probably be opposed to banning master meter systems.

A ban on natural gas master meter systems may cause the operators of some existing systems to change the fuel used in the system. For instance, an operator might switch to propane or a propane/air mixture. This would not necessarily represent an improvement in the safety of the system, since the operator may not know any more about propane and the safe operation of an LPG distribution system (propane is a type of LPG) than about natural gas and the safe operation of a natural gas distribution system. Therefore, while natural gas safety improves, overall public safety remains more or less the same as before. In the case of a switch to LPG, it might be noted, a system would still be subject to the Minimum Federal Safety Standards, as they apply to LPG. A system would not be subject to the Minimum Federal Safety Standards, of course, if the switch were to electricity.

There appears to be a tendency for legislatures and regulators to "grandfather" existing systems by allowing systems already in operation to continue as before. If this is done, then the safety of the current systems is not effected by banning master meter systems in a state. If existing systems are "grandfathered", then only in states with a growing number of master meter systems would there be any appreciable safety impact from a ban on master meter systems. As can be seen from a comparison of Exhibit 1 with Appendix A, there appear to be few states that have experienced a growth in master meter systems.

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[97]Order, Case No. U-4211, Michigan Public Service Commission, April 29, 1974, p. 4, and its February 11, 1993 letter to RSPA.

[98]E-mail from Jeffrey Kline, Senior Valuation Engineer, Safety Section, Office of Gas & Water, New York State Department of Public Service, to Paul Zebe, Volpe Center, November 6, 2000.

[99]Telephone conversation with Dean Scott, Texas Railroad Commission.

6.3. REQUIRE THAT LOCAL GAS UTILITIES ABSORB THE FACILITIES OF MASTER METER SYSTEMS

Another way to get local gas utilities to assume responsibility for master meter systems would be to require that they take over and absorb the facilities of those master meter systems they supply with natural gas. Under this approach, sometimes referred to as master meter system conversion, the utilities assume both ownership and operation of all of the jurisdictional facilities of the master meter systems (i.e., all of the facilities of the master meter systems that are subject to the minimum Federal Safety Standards). These facilities are incorporated and integrated into the utilities' systems, and the master meter systems, as operating units, cease to exist.

The absorption or conversion of master meter systems would eliminate most, if not all, of the safety problems associated with the systems, as well as the need for targeted system inspection.[100] The facilities would be operated by gas pipeline professionals who understand the requirements of the minimum Federal Safety Standards and whose systems are generally in compliance with those standards. Furthermore, liability considerations, among other things, will tend to ensure that the facilities are brought into compliance with 49 CFR 192.

The absorption of a master meter system by its gas supplier often necessitates some modifications to the system to bring it into compliance with the Minimum Federal Safety Standards. These can include such things as re-piping the system or making other modifications to the piping both inside and outside of the buildings. It appears that these modifications are generally expected to be paid for by the master meter operator, not the utility. It should be noted that master meter system operators who find that they must pay for modifications to their systems to bring them into compliance with the Minimum Federal Safety Standards could be liable for these same costs even if their systems are not absorbed by their gas suppliers, since they are obligated by law to bring their systems into full compliance with the Minimum Federal Safety Standards and may face civil penalties that can be as much as $10,000 for each violation if they fail to do so.[101]

The actual costs that master meter system operators will face when they have their systems converted will vary somewhat, depending on what needs to be done. In 1986, the Stamford, Connecticut, Housing Authority had Connecticut Light and Power (CL&P) convert its system on Lawn Avenue and Custer Street, which had connections to 22 buildings. CL&P installed new underground service lines and connected the new lines into the existing building piping. The charge by CL&P for this work

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[100]The pipeline inspection unit into which the facilities of the master meter system have been incorporated will, of course, continue to be inspected. In the inspection, the records and procedures of the operator of the unit will be expected to cover the facilities obtained from the master meter operator, just as they will be expected to cover all other facilities of the unit. Furthermore, spot checks made in the field during the inspection might be made at the former master meter system facilities, just as they might be made anywhere else in the unit. In general, however, unless problems are discovered, the facilities obtained from the master meter operator will not be a focus of the inspection.

[101]Some utilities, as a standard practice, require the systems that they take over to be replaced to ensure that they meet current Federal standards.

averaged approximately $3,900 per building.[102]

In addition to the cost of the modifications required to bring a master meter system into compliance with the regulations, a master meter system operator may also be required by the utility to pay for the installation of individual meters (and system changes associated with the installation of meters), if the system is not already sub-metered. For instance, in the late 1980s, Michigan Consolidated Gas Company, requires master meter systems without sub-metering that are converting to individual meters to pay for

> ...(a) installation of meters and regulators, but not the cost of meters and regulators, (b) relocation of any service lines, (c) additional service lines, (d) additional main in excess of twice the increased annual revenue resulting from conversion, and (e) removal of existing facilities.[103]

A master meter system, it might be noted, would be credited by Michigan Consolidated Gas Company for the "salvage value of the facilities removed except meters and regulators."[104]

One inducement that can be used to encourage master meter operators who may not be in full compliance with the pipeline safety regulations (or are not sure whether they are in compliance) to let their systems be taken over by their gas suppliers is to point out the cost of bringing a system into compliance with the Minimum Federal Safety Standards. These costs can be substantial. Master meter operators can avoid some (though, as mentioned earlier, not all) of these costs by turning their systems over to their gas suppliers. For example, operators can avoid most, if not all, of the cost of an O&M plan, because it costs relatively little for a gas utility to modify its existing O&M plan to include the pipeline facilities obtained from a master meter operator.[105] Because of the cost savings that can be realized, conversion can often make economic sense in spite of the costs that may be incurred by the master meter system operator. It makes even more economic sense when the civil penalties that can be imposed for failure to bring a system into compliance are taken into consideration.

Many regulators at both the Federal and state levels appear to feel that the takeover of master meter systems by the utility is the best way to handle the safety problems of master meter systems. In a number of states (see Exhibit 9), regulators encourage master meter systems to allow their system to be taken over by the utility. In many cases, some of which were discussed earlier (see Section 4.3.1), these regulators have been successful in their efforts. It should be noted that no state currently requires that master meter systems be taken over by their gas supplier. Any takeovers are voluntary both on

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[102]Enclosures with letter from Philip Sher, Associate Engineer, Connecticut Department of Public Utility Control, to Paul Zebe, Volpe Center, December 18, 1989.

[103]Section B5.3(D), Rules of Service, Michigan Consolidated Gas Company, March 17, 1987.

[104]Section B5.3(D), Rules of Service, Michigan Consolidated Gas Company, March 17, 1987.

[105]Telephone conversation with Richard Sanders, Chief, Pipeline Safety Division, Transportation Safety Institute, U.S. DOT, February 20, 1990.

the part of the local gas utility and on the part of the master meter system.

There may be some resistance to the takeover of master meter systems by their suppliers. This resistance may come from any one of three sources: the utilities, the master meter operators, or the master meter system customers.

Some utilities are reportedly concerned about liability.[106] This concern can probably be overcome if it is left to the master meter operator to bring the system up to specifications before it is transferred to the utility. Utilities are also concerned about getting paid for the gas they supply.[107] When a master meter system is the customer, one person, the system's operator, is responsible for paying for the gas. When a utility takes over a master meter system, each of the customers of the former master meter system becomes individually responsible for paying for the gas that they use.

The cost to the utilities will increase if they take over the master meter systems that they supply with natural gas. This may also be a cause for utilities to resist taking over master meter systems. One cost to utilities that will increase if they take over master meter systems is the cost of billing--that is, the cost of preparing and mailing bills, and the cost of processing the paid bills that are received. This will be the result of having to send bills for the gas that is sold to each household, rather than just to owners of the master meter systems. Another related cost that may also go up is the cost of collecting on unpaid bills.

Master meter operators may resist giving up their systems because they would be giving up the profits they make on the gas they provide their customers. This resistance, however, may not be too significant. It is reported that with stable gas prices, many systems are profitable, but with relatively unstable gas prices, systems are quite unprofitable.[108] Recently, systems probably have not been particularly profitable because of increases in gas prices.

Some operators may switch fuels rather than let their systems be taken over by the pipeline utility. In Missouri, after the Missouri Public Service Commission issued its order requesting that utilities take over master meter systems for one dollar after the master meter system had been brought up to specifications, some systems are reported to have switched to propane or propane/air mixtures.[109]

Customers may object to the takeover of master meter systems by a utility company if they believe

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[106]Telephone conversation with Fred Joyner, Regional Chief, Southern Region, Office of Pipeline Safety, U.S. DOT/RSPA.

[107]Telephone conversations with Richard Sanders, Chief, Pipeline Safety Division, Transportation Safety Institute, U.S. DOT/RSPA, and Fred Joyner, Regional Chief, Southern Region, Office of Pipeline Safety, U.S. DOT/RSPA.

[108]Telephone conversation with Richard Sanders, Chief, Pipeline Safety Division, Transportation Safety Institute, U.S. DOT/RSPA.

[109]Telephone conversation with Ed Ondak, Regional Director, Central Region, Office of Pipeline Safety, U.S. DOT/RSPA.

that gas costs will increase. Many, if not most, master meter systems purchase gas at a discount from their supplier. Sometimes, all or part of this discount is passed on to the system's customers. When this is the case, the customer's cost of gas can be expected to rise once a system is taken over by the utility. It should be noted that in some instances, the cost of gas from the master meter system may be higher than the cost of gas from the local utility. When this is the case, the cost of gas to the customer will go down as a result of the takeover of the master meter system.

6.4. REQUIRE THAT MASTER METER OPERATORS TURN OVER OPERATION OF THEIR SYSTEMS TO LOCAL GAS UTILITIES

A third way to get local gas utilities to assume responsibility for master meter systems would be to require master meter operators to turn over the operation of their systems to local gas utilities. Under this approach, the local gas utilities assume operational control of the master meter systems, but the master meter operators retain ownership of their systems. Master meter system operators would be responsible for reimbursing the local gas utilities for their work.

The safety impact of this approach would be very similar to that resulting from master meter system conversion (see Section 6.3). The approach would ensure that natural gas professionals who understand the requirements of the Minimum Federal Safety Standards would operate the master meter facilities. As a consequence, the safety of those facilities should be comparable to the safety of those of local gas utilities.

The cost of this approach would also be very similar to that of master meter system conversion. It is likely, however, that 100 percent of those costs would be borne by the master meter system operators, themselves, who would be likely to pass them on to the ultimate consumers of the gas through higher rents and fees. Economies of scale available to the local gas utilities should mean that the costs to master meter operators would generally be less than if they operated their systems in a manner consistent with the Minimum Federal Safety Standards but independently of their local gas utilities.

7. FINDINGS

7.1. INTRODUCTION

This report has examined master meter systems in the U.S., their safety regulation, and the need for an improved inspection program for the systems. The principal findings of the report are summarized below.

7.2. KEY FINDINGS

The key findings of this study concern (1) change over time in the number of master meter systems, (2) the expanding assumption of the responsibility for the safety of those systems by the states, and (3) the ongoing efforts to improve and ensure the safety of those systems.

7.2.1. Number of Master Meter Systems

There were an estimated 8.3 thousand master meter systems in the U.S. in 1999. This represents a decline from 1979, when it was estimated that there were approximately 81 thousand master meter systems in operation. This decline in the number of master meter systems is due, at least in part, to (1) efforts by master meter system operators to make their customers directly accountable for the cost of the natural gas that they use; and (2) efforts by regulators to get master meter systems to merge with the utilities that supply the systems with gas.

7.2.2. Responsibility for the Safety of Master Meter Systems

Responsibility for master meter system safety has shifted over the years to the point where the state agencies are now very much in the majority (OPS favors this on the basis that jurisdiction of this kind is best handled by the states, and urges states accordingly). At the end of 1999, 43 states exercised either partial or full jurisdiction over master meter system safety. The figures for ten years earlier, 1989, were 37 with either partial or full jurisdiction. This upward trend in the number of states assuming full responsibility for the safety of their pipeline systems is expected to continue. Of the seven states not undertaking partial or full responsibility for their master meter systems, at least two have no such systems within their borders.

7.2.3. Ongoing Efforts to Improve and Ensure the Safety of Master Meter Systems

In 1999, master meter systems were inspected at least once a year in 19 states (Alabama, Colorado, Delaware, Florida, Illinois, Indiana, Kansas, Louisiana, Minnesota, Mississippi, Missouri, New Hampshire, New Jersey, North Carolina, North Dakota, Rhode Island, South Carolina, South Dakota, and Tennessee); at least once every two years in 7 states (Arizona, Arkansas, Nevada, New

York, Maryland, Ohio, and Washington);[110] and at least once every three years in 8 states (Kentucky, Nebraska, New Mexico, Oklahoma, Oregon, Texas, West Virginia, and Wisconsin). Inspection occurs at intervals greater than three years in two states (California and Virginia). Intervals were irregular in five states (Alaska, Hawaii, Idaho, Massachusetts, and Pennsylvania), as well as Puerto Rico (for further explanation of "irregularly" see Exhibit 8). Of the remaining eight states, two are in the process of doing an initial identification of master meter systems and have not yet established an inspection frequency (Montana and Utah), six states (Connecticut, Iowa, Michigan, Vermont, Maine, and Wyoming) and the District of Columbia have no master meter systems, and definitive information is unavailable for one state (Georgia).

In addition to inspection, the OPS and states engage in a number of activities to help improve and ensure the safety of master meter systems. Included among these activities are formal and informal training programs and the production and distribution of training and informational aides, such as the OPS's *Guidance Manual for Operators of Small Gas Systems.*

[110]Section 108a of the Pipeline Safety Reauthorization Act of 1988 requires the OPS, if funds are available, to inspect gas distribution systems at least once every two years.

8. RECOMMENDATION

8.1 CONCLUDING RECOMMENDATION

The concluding recommendation of this report is that OPS continue the present policy of (1) pressing for all states to have full jurisdiction over master meter system safety, (2) where a state has not taken jurisdiction, continuing with OPS inspections of those master meter systems (including enforcement action as needed) where in OPS's judgement there is a likelihood of probable violations or there are other safety concerns, and (3) investigating master meter system incidents not being covered by another qualified agency. This recommendation is based on the following:

- The declining number of master meter systems, as summarized in 7.2.1
- Increasing state involvement in improving and ensuring master meter system safety, as summarized in 7.2.2 and 7.2.3, and
- The efforts being made to ban new master meter systems, and encourage local gas distribution companies to take over the responsibility for the safety of existing ones, as discussed in Sections 4.3, 6.2, and 6.3.

A SELECTED BIBLIOGRAPHY

American Gas Association, *Gas Facts*, AGA, Arlington, VA, 1996.

Arthur D. Little, Inc., *Natural Gas Pipeline Safety in Master-Metered Residential Areas*, ADL, Cambridge, MA, April 1975.

Atallah, S., Athens, P., Jeffreys, D., Linstrom, R., and O'Brien, J., *Handbook on Natural Gas Pipeline Safety in Residential Areas Served by Master Meters*, U.S. Department of Housing and Urban Development, Washington, DC, April 1975.

Dixon, T., "How North Carolina Solved Its Master Meter Problem," *Gas Industries*, October 1981, pp.26, 28.

National Association of Regulatory Utility Commissioners, *Utility Regulatory Policy in the United States and Canada, Compilation 1995-1996*, NARUC, Washington, DC, 1996.

Seisler, J. M., "Escaping the Energy Bite: Converting Master Meters," *Journal of Property Management*, May/June 1980, pp. 146-151.

Systems & Applied Sciences Corporation (SASC), *An Analysis of Natural Gas Master Meter Systems (Definition & Program) From A Federal Perspective*, Final Report, SASC, Riverdale, MD, June 1979.

U.S. Department of Transportation, Office of Pipeline Safety, "Report on Pipeline Safety, Calendar Years 1995-1996," U.S. DOT/RSPA/OPS, Washington, DC.

U.S. Department of Transportation, Office of Pipeline Safety, "Exercise of Jurisdiction Over Master Meter Operators," U.S. DOT/RSPA/OPS, Washington, DC., March 1984.

U.S. Department of Transportation, Office of Pipeline Safety, *Guidance Manual for Operators of Small Gas Systems*, U.S. DOT/RSPA/OPS, Washington, DC, Revised August 1997.

U.S. Department of Transportation, "RSPA Response to NAPSR Resolutions," *Reauthorization of Pipeline Safety Programs*, Hearing Before the Subcommittee on Surface Transportation of the Committee on Public Works and Transportation, U.S. House of Representatives, 100th Congress, 1st Session, May 14, 1987.

INDIVIDUALS PROVIDING INFORMATION FOR THIS STUDY

Alabama

Chris J. Harvey, Alabama Public Service Comm.

Alaska

Staff, Alaska Department of Commerce and Economic Development

Arizona

Terry Fronterhouse, Arizona Corporation Commission

Dan Weaklend, Arizona Corporation Commission

Arkansas

Don Martin, Arkansas Public Service Comm.

Myron E. Thompson, Arkansas Public Service Commission

California

Russell Copeland, California Public Utilities Commission

Mahendra Jhala, California Public Service Commission

Al Kirchem, California Public Utilities Commission

Colorado

Steve Pott, Colorado Public Utilities Commission

Ernest Tronco, Colorado Public Utilities Commission

Connecticut

Philip Sher, Connecticut Department of Public Utility Control

Delaware

Malak S. Michael, Delaware Public Service Commission

Leon H. Ryan, Jr., Delaware Public Service Commission

District of Columbia

Richard D. Huriaux, DC Public Service Comm.

Florida

C. Edward Mills, Florida Public Service Commission

Georgia

Danny McGriff, Georgia Public Service Commission

R. Lynnard Tessner, Georgia Public Service Commission

Hawaii

Yukio J. Onaka, Hawaii Public Utilities Commission

Idaho

David Schunke, Idaho Public Service Commission

Illinois

Rex Evans, Illinois Commerce Commission

Steve Smock, Illinois Commerce Commission

Indiana

Larry V. Nisley, Indiana Utility Regulatory Comm.

Iowa

Donald J. Strusma, Iowa State Utilities Board

Kansas

Gary Hall, Kansas Corporation Commission

Leo Haynos, Kansas Corporation Commission

Glenn Smith, Kansas Corporation Commission

Kentucky

Eddie B. Smith, Kentucky Public Service Commission

E. Scott Smith, Kentucky Public Service Comm.

Louisiana

John E. Land, Louisiana Department of Natural Resources

James M. Mergist, Louisiana Department of Natural Resources

Maine

David Di Profio, Maine Public Utilities Commission

Gary Farmer, Maine Public Utilities Commission

Maryland

John Clementson, Maryland Public Service Commission

Alex Dankanich, Maryland Public Service Commission

Simon Hoplin, Maryland Public Service Commission

Massachusetts

David Weber, Massachusetts Department of Public Utilities

Michigan

Paul Proudfoot, Michigan Public Service Comm.

Ram Veerapaneni, Michigan Public Service Commission

Minnesota

Brad Ardner, Minnesota Office of Pipeline Safety

William Barbeau, Minnesota Office of Pipeline Safety

Walt Kelly, Minnesota Office of Pipeline Safety

Charles Kenow, Minnesota Office of Pipeline Safety

Michael J. McGrath, Minnesota Office of Pipeline Safety

Steve Sweeney, Minnesota Office of Pipeline Safety

Ronald Wiest, Minnesota Office of Pipeline Safety

Mississippi

Lyla Carnley, Mississippi Public Service Comm.

Rickey L. Cotton, Mississippi Public Service Commission

Jessie Parker, Mississippi Public Service Commission

Missouri

Ron Ellis, Missouri Public Service Commission

Michael Loethen, Missouri Public Service Commission

Montana

Dennis Crawford, Montana Public Service Commission

Joel Tierney, Montana Public Service Comm.

Nebraska

Lavern Rinehart, Nebraska State Fire Marshal's Office

Leonard Steiner, Nebraska State Fire Marshall's Office

Nevada

Jeffrey L. Maples, Nevada Public Service Commission

Craig C. Steele, Nevada Public Utilities Commission

New Hampshire

Paula M. Bergeron, New Hampshire Public Utilities Commission

Richard G. Marini, New Hampshire Public Utilities Commission

New Jersey

David McMillan, New Jersey Board of Public Utilities

Nusha Wyner, New Jersey Board of Public Utilities

New Mexico

Vince Martinez, New Mexico State Corporation Commission

Rey S. Medina, New Mexico State Corporation Commission

New York

John E. Gawronski, New York Public Service Commission

Jeffrey Kline, New York Public Service Commission

North Carolina

Tom Dixon, North Carolina Utilities Commission

North Dakota

Alan G. Moch, North Dakota Public Service Commission

Ohio

Ed Steel, Ohio Public Utilities Commission

Robert S. Stone, Ohio Public Utilities Commission

Oklahoma

Dennis Fothergill, Oklahoma Corporation Commission

Oregon

Jack P. Dent, Oregon Public Utility Commission

H. R. Garabrant, Oregon Public Utility Commission

Pennsylvania

William E. Smeigh, Jr., Pennsylvania Public Utility Commission

Rhode Island

Paul G. Grieco, Rhode Island Public Utilities Commission

Don Leverdis, Rhode Island Public Utilities Commission

South Carolina

Vernon L. Gainey, South Carolina Public Service Commission

James S. Stites, South Carolina Public Service Commission

South Dakota

Martin Bettmann, South Dakota Public Service Commission

Tennessee

Glenn Blanton, Tennessee Public Service Commission

Texas

Mary L. McDaniel, Texas Railroad Commission

Dean Scott,
Texas Railroad Comm.

Utah

S. Kent Evans, Utah Department of Commerce

John Strawn, Utah Department of Business Regulation

Vermont

Kenneth W. Wood, Vermont Department of Public Service

Virginia

Ryland Y. Bailey, Virginia State Corporation Commission

Massoud Tahamtani, Virginia State Corporation Commission

Washington

Ray C. Colby, Washington Utilities and Transportation Comm.

Douglas Kilpatrick, Washington Utilities and Transportation Commission

West Virginia

David Hippchen, West Virginia Public Service Commission

Darrell A. McKown, West Virginia Public Service Commission

Wisconsin

Harold Meyer, Wisconsin Public Utilities Comm.

Wyoming

Jon F. Jacquot, Wyoming Public Service Comm.

U.S. HUD

Charles Ashmore, U.S. Department of Housing and Urban Development

Mark A. Isaacs, U.S. Department of Housing and Urban Development

U.S. DOT

Zack Barrett, Office of Pipeline Safety, U.S. DOT/RSPA

Buzz Fant, Transportation Safety Institute, U.S. DOT/RSPA

William Gute, Office of Pipeline Safety, U.S. DOT/RSPA

Jaime A. Hernandez, Office of Pipeline Safety, U.S. DOT/RSPA

Chris Hoidal, Office of Pipeline Safety, U.S. DOT/RSPA

Fred Joyner, Office of Pipeline Safety, U.S. DOT/RSPA

Ralph Kubitz, Office of Pipeline Safety, U.S. DOT/RSPA

Warren Miller, Office of Pipeline Safety, U.S. DOT/RSPA

Ed Ondak, Office of Pipeline Safety, U.S. DOT/RSPA

Jack Overly, Office of Pipeline Safety, U.S. DOT/RSPA

Richard Sanders, Transportation Safety Institute, U.S. DOT/RSPA

Jeff Stahoviak, Office of Pipeline Safety, U.S. DOT/RSPA

Jim Thomas, Office of Pipeline Safety, U.S. DOT/RSPA

Lloyd Ulrich, Office of Pipeline Safety, U.S. DOT/RSPA

APPENDICES

APPENDIX A.
ESTIMATED NUMBER OF GAS MASTER METER SYSTEMS IN OPERATION IN 1979

	95 Percent Confidence Interval				95 Percent Confidence Interval		
State	Lower Limit	Expected	Upper Limit	State	Lower Limit	Expected	Upper Limit
Alabama	376	468	850	Nebraska	906	1,242	2,574
Alaska	na	28	na	Nevada	105	108	160
Arizona	527	975	1,423	New Hampshire	27	35	55
Arkansas	888	1,756	2,624	New Jersey	unk	unk	unk
California	11,877	12,935	24,986	New Mexico	89	421	753
Colorado	1,611	3,623	5,635	New York	238	345	715
Connecticut	na	0	na	North Carolina	369	428	772
Delaware	16	16	16	North Dakota	107	113	178
Florida	172	277	506	Ohio	89	207	585
Georgia	365	422	587	Oklahoma	836	2,309	4,761
Hawaii	unk	unk	unk	Oregon	na	4	na
Idaho	3	3	3	Pennsylvania	681	1,171	2,192
Illinois	474	1,142	2,388	Rhode Island	29	30	40
Indiana	105	115	125	South Carolina	166	252	338
Iowa	15	27	54	South Dakota	591	966	1,341
Kansas	463	1,127	1,791	Tennessee	318	430	542
Kentucky	484	1,019	1,554	Texas	23,553	39,404	55,255
Louisiana	434	2,623	4,812	Utah	196	196	196
Maine	0	0	0	Vermont	0	0	0
Maryland	207	214	303	Virginia	588	762	1,362
Massachusetts	241	386	531	Washington	29	33	37
Michigan	459	1,136	2,816	West Virginia	186	514	1,504
Minnesota	70	72	166	Wisconsin	1,051	1,317	2,176
Mississippi	139	178	270	Wyoming	459	710	961
Missouri	111	245	359	D.C.	85	85	85
Montana	1,004	1,046	1,111	*Total for U.S.*[a]	64,738	80,915	101,901

Key:

na = Not applicable
unk = No data received
a = Estimates include nothing for Hawaii or New Jersey.

Source of information: SASC, pp. 5-15 to 5-17.

APPENDIX B
U.S. CODE, TITLE 49, SECTIONS 60105 AND 60106

Sec. 60105. State pipeline safety program certifications

(a) General Requirements and Submission. - Except as provided in this section and sections 60114 and 60121 of this title, the Secretary of Transportation may not prescribe or enforce safety standards and practices for an intrastate pipeline facility or intrastate pipeline transportation to the extent that the safety standards and practices are regulated by a State authority (including a municipality if the standards and practices apply to intrastate gas pipeline transportation) that submits to the Secretary annually a certification for the facilities and transportation that complies with subsections (b) and (c) of this section.

(b) Contents. - Each certification submitted under subsection (a) of this section shall state that the State authority -

(1) has regulatory jurisdiction over the standards and practices to which the certification applies;
(2) has adopted, by the date of certification, each applicable standard prescribed under this chapter or, if a standard under this chapter was prescribed not later than 120 days before certification, is taking steps to adopt that standard;
(3) is enforcing each adopted standard through ways that include inspections conducted by State employees meeting the qualifications the Secretary prescribes under section 60107(d)(1)(C) of this title;
(4) is encouraging and promoting programs designed to prevent damage by demolition, excavation, tunneling, or construction activity to the pipeline facilities to which the certification applies;
(5) may require record maintenance, reporting, and inspection substantially the same as provided under section 60117 of this title;
(6) may require that plans for inspection and maintenance under section 60108 (a) and (b) of this title be filed for approval;
and
(7) may enforce safety standards of the authority under a law of the State by injunctive relief and civil penalties substantially the same as provided under sections 60120 and 60122(a)(1) and (b)-(f) of this title.

(c) Reports. - (1) Each certification submitted under subsection (a) of this section shall include a report that contains -

(A) the name and address of each person to whom the certification applies that is subject to the safety jurisdiction of the State authority;
(B) each accident or incident reported during the prior 12 months by that person involving a fatality, personal injury requiring hospitalization, or property damage or loss of more than an amount the Secretary establishes (even if the person sustaining the fatality, personal injury, or property damage or loss is not subject to the safety jurisdiction of the authority), any other accident the authority considers significant, and a summary of the investigation by the authority of

the cause and circumstances surrounding the accident or incident;

(C) the record maintenance, reporting, and inspection practices conducted by the authority to enforce compliance with safety standards prescribed under this chapter to which the certification applies, including the number of inspections of pipeline facilities the authority made during the prior 12 months; and

(D) any other information the Secretary requires.

(2) The report included in the first certification submitted under subsection (a) of this section is only required to state information available at the time of certification.

(d) Application. - A certification in effect under this section does not apply to safety standards prescribed under this chapter after the date of certification. This chapter applies to each applicable safety standard prescribed after the date of certification until the State authority adopts the standard and submits the appropriate certification to the Secretary under subsection (a) of this section.

(e) Monitoring. - The Secretary may monitor a safety program established under this section to ensure that the program complies with the certification. A State authority shall cooperate with the Secretary under this subsection.

(f) Rejections of Certification. - If after receiving a certification the Secretary decides the State authority is not enforcing satisfactorily compliance with applicable safety standards prescribed under this chapter, the Secretary may reject the certification, assert United States Government jurisdiction, or take other appropriate action to achieve adequate enforcement. The Secretary shall give the authority notice and an opportunity for a hearing before taking final action under this subsection. When notice is given, the burden of proof is on the authority to demonstrate that it is enforcing satisfactorily compliance with the prescribed standards.

Sec. 60106. State pipeline safety agreements

(a) General Authority. - If the Secretary of Transportation does not receive a certification under section 60105 of this title, the Secretary may make an agreement with a State authority (including a municipality if the agreement applies to intrastate gas pipeline transportation) authorizing it to take necessary action. Each agreement shall -

(1) establish an adequate program for record maintenance, reporting, and inspection designed to assist compliance with applicable safety standards prescribed under this chapter; and

(2) prescribe procedures for approval of plans of inspection and maintenance substantially the same as required under section 60108 (a) and (b) of this title.

(b) Notification. - Each agreement shall require the State authority to notify the Secretary promptly of a violation or probable violation of an applicable safety standard discovered as a result of action taken in carrying out an agreement under this section.

(c) Monitoring. - The Secretary may monitor a safety program established under this section to ensure that the program complies with the agreement. A State authority shall cooperate with the Secretary

under this subsection.

(d) Ending Agreements. - The Secretary may end an agreement made under this section when the Secretary finds that the State authority has not complied with any provision of the agreement. The Secretary shall give the authority notice and an opportunity for a hearing before ending an agreement. The finding and decision to end the agreement shall be published in the Federal Register and may not become effective for at least 15 days after the date of publication.

APPENDIX C

TITLE 83: PUBLIC UTILITIES
CHAPTER I: ILLINOIS COMMERCE COMMISSION
SUBCHAPTER d: GAS UTILITIES

PART 520
TRAINING PROGRAMS FOR NATURAL GAS SYSTEM OPERATING PERSONNEL
(GENERAL ORDER 204)

Section
520.10 Training Procedures
520.20 Definitions
520.30 "Natural Gas System"

AUTHORITY: Implementing Section 6 and authorized by Section 3 of the "Illinois Gas Pipeline Safety Act" (Ill. Rev. Stat. 1985, ch. 111 2/3, pars. 556 and 553).

SOURCE: Adopted at 4 Ill. Reg. 8, p. 134, effective February 18, 1980; codified at 8 Ill. Reg. 5147.

Section 520.10 Training Procedures

a) In order to reasonably assure the safety and well being of the populace, each natural gas system operator in Illinois shall develop training procedures which will assure that its field employees engaged in construction, operation, inspection and maintenance of the gas system are properly trained.

1) The procedures shall contain adequate descriptions of the types of training each job classification requires including those of field foremen, field crew leaders, leak inspectors, new construction inspectors, servicemen and corrosion technicians and/or equivalent classifications.

2) The procedures shall include scheduling of verbal instruction and/or on-the-job training for each job classification.

3) The procedures shall include provisions for evaluating the performance of personnel to assure their competency in performing the work assigned to them.

4) The procedures shall include subject matter relating to recognition of potential hazards, and actions to be taken toward prevention of accidents.

5) The procedures shall be updated periodically to include new materials, new methods of operation and installation, and changes in general procedures.

6) The procedures shall be made a part of the gas system's operation, inspection and maintenance plans, and shall be filed with the Commission.

7) The procedures shall be developed and ready for implementation within one year of the date of adoption of this Part.

b) Operators of small gas systems, such as municipal gas systems and master meter gas systems, may satisfy the requirements of Section 520.10(a) if the gas system personnel attend regularly scheduled instructional courses held by utility companies or participate in courses such as the Institute of Gas Technology (IGT) Gas Distribution Home Study Course, or programs developed and presented by community colleges, vocational schools, universities, consultants or other recognized gas distribution oriented agencies, which includes the procedures outlined in Section 520.10(a) which will pertain to their particular system.

Section 520.20 Definitions

As used in this Part, unless the context requires otherwise, the terms defined in Sections 520.10 through 520.30, inclusive, have the meanings ascribed therein.

Section 520.30 "Natural Gas System"

"Natural Gas System" means transmission or distribution facilities that transport natural gas as defined in Sections 1-3 of the Illinois Gas Pipeline Safety Act (Ill. Rev. Stat. 1981, ch. 111 2/3, pars. 551-553).

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