

STATEMENT OF GEORGE W. TENLEY, JR.
ASSOCIATE ADMINISTRATOR FOR PIPELINE SAFETY
RESEARCH AND SPECIAL PROGRAMS ADMINISTRATION
DEPARTMENT OF TRANSPORTATION

BEFORE THE
SENATE COMMITTEE ON ENERGY AND NATURAL RESOURCES

APRIL 19, 1994

Good morning Mr. Chairman and members of the Committee.

I am George W. Tenley, Jr., Associate Administrator for Pipeline Safety, in the Research and Special Programs Administration (RSPA). Thank you for the opportunity to appear before you today to testify on behalf of Secretary Peña and the Department of Transportation concerning important issues arising out of the March 23, 1994, Texas Eastern Transmission Corporation natural gas pipeline failure in Edison, New Jersey.

I. Overview

The mission of RSPA's pipeline safety program is to "protect the people and the environment of the United States through a comprehensive pipeline safety program that includes effective risk management, thorough pipeline operator compliance, high quality training, and a strong, balanced Federal-State Partnership."

RSPA's oversight responsibility covers a transportation system of 1.7 million miles of pipe transporting natural gas to 55 million

residential and commercial customers, as well as 25 percent of the nation's intercity freight consisting of over 605 billion ton miles annually of petroleum and other materials.

Our goal continues to be assuring the highest level of public safety and environmental protection at a cost commensurate with real risk. Our primary strategy is emphasizing prevention of accidents and spills through design and construction standards, operational practices which maintain pipeline integrity, adequate monitoring and leak detection systems, and emergency response procedures that mitigate consequences to the maximum degree practicable.

We face a number of challenges as the stewards of the pipeline safety program including: an aging infrastructure; increasing population development encroaching on pipeline rights-of-way; growing importance of environmental protection from pipeline releases; rising public and congressional demands for more safeguards; and financial pressures on the pipeline industry to control their costs.

The Texas Eastern explosion brought all these challenges into sharp focus. I believe the only way we can realistically hope to deal with these challenges is by DEFINING, UNDERSTANDING, and MANAGING the potential risk that this vast underground transportation infrastructure poses to people and the

environment. To be successful, the concept of risk management has to be accepted. We must focus on effective risk management, recognizing that risk cannot completely be eliminated.

Over the last several years, RSPA has taken the necessary first steps in moving toward a risk-based program. We intend to accelerate that progress through a four-tiered approach that integrates the necessary actions of Federal, state, and local governments, and the pipeline industry. The **Federal Government** must utilize effective risk management techniques in all aspects of its pipeline safety program (regulatory and compliance). **States** must take full jurisdiction over intrastate pipelines to assure sufficient safety oversight, and must assure that they have effective state laws governing the responsibilities of those who excavate around pipelines. **Local governments** must examine local land use controls around pipelines. **Industry** must be more proactive in promoting pipeline safety, including informing the public of the many positive actions it is taking to address risk.

Before addressing the specific questions in the Committee's letter requesting the Department's appearance at this hearing, I will summarize immediate actions RSPA has taken to deal with the Texas Eastern explosion and the status of the investigation.

II. Actions Taken and Status of Investigation

The Texas Eastern incident resulted in only one fatality (a heart attack) and 50 non-life threatening injuries. At least 128 living units in an adjacent apartment complex were completely destroyed and about 2,000 residents were left temporarily homeless. Had the rupture occurred closer to the apartment complex, the results could have been much worse.

Following the explosion, RSPA issued a Hazardous Facility Order directing Texas Eastern to take immediate corrective actions including (1) restricting the maximum operating pressure of the pipeline until other corrective actions have been satisfactorily completed; (2) exposing the pipeline in the area of the failure to determine whether any gouges or dents were present and to replace damaged pipes; and (3) submitting a plan for internal instrumented inspection ("smart pigging") of the line to identify the location of any flaws which could result in serious safety consequences. Based upon successful completion of short-term actions, including a hydrostatic pressure test conducted at the behest of Edison Mayor Spadoro, RSPA allowed Texas Eastern to return the pipeline to service on April 13 at reduced pressure, pending completion of longer term actions.

In the meantime, RSPA is continuing its evaluation of Texas Eastern operations and compliance with the pipeline safety

regulations. RSPA has determined the pipeline was not overpressured. At this point, RSPA has not discovered any probable violations, but that phase of investigation is just beginning.

With respect to the cause of the failure, preliminary examinations of the pipe indicate evidence of mechanical damage, possibly indicating third-party damage from heavy equipment. RSPA is cooperating in the investigation with the National Transportation Safety Board (NTSB), which is responsible for determining the probable cause of the failure. We are witnessing NTSB metallurgical examinations of the pipe and jointly assessing the results from pig runs conducted by Texas Eastern in 1986.

We are working closely with our state partner, the New Jersey Board of Regulatory Commissioners (BRC), to perform a comprehensive review of the estimated 1,000 miles of interstate natural gas transmission lines in New Jersey that are operated by six interstate pipeline companies. The BRC is responsible for safety oversight of all intrastate natural gas pipelines in the state and has been granted temporary interstate agent status to participate with RSPA in the investigation of this incident. We estimate the field investigation of these interstate lines will take between 2 and 3 months to complete.

We are providing funding to the New Jersey Institute of Technology to address risks arising from aging infrastructure and investigate the impact of urban development encroaching on natural gas pipelines. We are also planning a safety summit in mid-July with national experts to investigate the numerous technical, social, and economic implications of the accident. We expect the deliberations conducted at the summit will provide important insights into pipeline risks and the means to manage those risks effectively.

In the balance of my testimony, I will discuss a number of other ongoing RSPA activities which address issues raised by the Texas Eastern explosion.

III. Current Policy Regarding Pipeline Rights-of-Way; How Program Addresses Problems Associated with Urban Encroachment

Land use planning has traditionally been under the purview of state and local governments, particularly local governments. RSPA has no authority to regulate land use planning. We are, however, working on some tools that will be of use to local land use planners in identifying existing pipelines. We are working with a coalition of Federal, state, industry, and environmental organizations to develop a national pipeline mapping system based on current geographic information systems technology. Such a system would support national decision making about regulatory

priorities and state and local decisions about land use, emergency, and infrastructure planning.

Under the Oil Pollution Act of 1990, hazardous liquid pipeline operators must submit plans to the Department for responding to worst-case oil spills from their facilities. Based on the review of these plans, we are creating a data base which is being used to rank environmentally sensitive areas at highest risk from pipelines. Though these planning requirements relate to hazardous liquid pipelines, there will be some application to natural gas pipelines.

Although pipelines are usually installed in unpopulated areas, it is a fact of modern American life that development all too frequently encroaches on pipelines. For example, although only 4 percent of Texas Eastern's gas transmission system nationwide is in populated areas, 39 percent of its system in New Jersey is in populated areas. The building boom in recent years, compounded by the trend to install utilities underground, has contributed to this problem. This situation makes pipelines vulnerable to the single leading cause of pipeline failures -- third-party excavation damage.

Government and industry need to identify the areas along pipelines where there is the greatest probability of damage from excavation and the greatest potential impact on people in the

event of rupture. Government and industry need to focus on where we should apply greater safeguards and vigilance and make the tough judgment calls that some areas (e.g., developed vs. undeveloped) are of greater priority than others.

IV. Program for Pipeline Inspections by Both Operators and OPS

RSPA's natural gas pipeline safety regulations require gas transmission pipeline operators to comply with a number of inspection provisions to assure the integrity of their pipelines. A sampling of these provisions includes the following:

- o During construction
 - The entire line must be inspected to ensure that it is constructed in accordance with applicable standards.
 - Pipe welds must be visually inspected and nondestructively tested for defects.
 - The entire line must be tested with water under high pressure to ensure it is in sound condition prior to start-up.
- o During operations

- Electrical inspections are required at specified intervals to assure that corrosion control measures are adequate.

- When an operator has reason to believe a line could be damaged by excavation activities, the line must be inspected during and after the activities to verify pipeline integrity.

- Each valve that might be required during an emergency must be inspected and operated at least once each calendar year.

- Each operator must have a program of continuing surveillance to determine unusual operating and maintenance conditions on its pipelines or any increases in population that could necessitate pressure testing or strengthening of the line.

- Each operator must have a patrol program to observe surface conditions adjacent to the right-of-way for indications of leaks, construction activity, and other safety-related factors. Patrol intervals range from quarterly to annually, depending on location.

- Transmission lines must be surveyed for leaks at least annually or, if the line is unodorized in populated areas, up to four times a year using leak detector equipment.

In addition to what we require of operators, we inspect all pipelines under Federal jurisdiction within a 3- to 5-year cycle, and higher risk pipelines more frequently, to determine compliance with these and other safety provisions. To determine inspection frequency, each RSPA Regional Director in the five pipeline safety regional offices creates an annual risk-based inspection plan using two computer-based Pipeline Inspection Priority Programs (PIPP). PIPP I is based on information submitted by pipeline operators in response to Federal reporting requirements, and PIPP II is based on information gathered by the regions during inspections, including enforcement actions taken. Local knowledge is also included in the annual inspection plan process to allow flexible management decisions.

V. Federal/State Relationship under the Pipeline Safety Program

The Federal/State Partnership is the cornerstone for assuring uniform implementation of the pipeline safety program nationwide. Alone, neither the Federal Government nor the states could assure the level of pipeline safety in the country today, given the size of the regulated community and the complexity of operations.

Together, Federal and state resources can be leveraged to deliver a cost-effective program that has one of the best safety records in transportation.

States have overwhelmingly supported the concept of common stewardship in gas pipeline safety. Currently, 47 states, the District of Columbia, and Puerto Rico participate in the gas program. In New Jersey, RSPA exercises safety jurisdiction over the 1,000 miles of interstate gas pipelines; and our state partner, the Board of Regulatory Commissioners, has authority over 27,000 miles of intrastate gas pipelines (largely gas distribution pipelines).

Each state agency participating in the program is eligible for grant funding of up to 50 percent of personnel, equipment, and activity costs associated with carrying out its program. In 1993, the Department awarded grants to state pipeline safety gas programs totaling \$6,300,000, which covered only an average of 34 percent of state costs. New Jersey received \$171,799, covering 32 percent of its costs.

RSPA is committed to moving toward full 50 percent funding of eligible state program costs on a phased basis, tied to improved state performance. Two critical performance factors which RSPA has established are state assumption of safety jurisdiction over

all intrastate pipelines and adoption of minimum one-call notification system requirements.

To improve its support of state pipeline safety programs, RSPA this year will have a "state liaison" person in each of its five regional pipeline safety offices (three liaisons are already in place). These liaisons are conducting annual evaluations of state programs and providing technical assistance in furtherance of state operations.

VI. How Recent Incident in New Jersey Might Have Been Prevented

We believe the occurrence of gas pipeline failures such as the one in New Jersey can be lessened by a combination of PREVENTION and DETECTION activities. The major PREVENTION activity is use of one-call notification systems to locate and mark underground utilities prior to excavation; the major DETECTION activity is increased inspection, such as the use of instrumented internal inspection devices (smart pigs).

Prevention. Outside force damage (particularly excavation damage) is a leading cause of pipeline accidents. In 1993, 35 percent of all pipeline accidents reported to the Department were caused by outside force damage. These accidents accounted for 57 percent of all reported fatalities, 32 percent of all reported

injuries, and 52 percent of all reported property damage from pipelines (see Attachment 1).

There is preliminary, though strong, indication that two of the most recent high visibility pipeline accidents were caused by excavation damage -- the Texas Eastern gas explosion being discussed here today and the March 1993 Colonial oil spill which closed down the Fairfax County, Virginia water supply for several days.

One-call notification systems which provide a communication link for excavators to notify underground facility operators of their intent to dig have proven to be an effective means for preventing excavation damage to pipelines. After the Colonial spill last year, the Department developed an Action Plan for protecting the environment from the risks posed by hazardous liquid pipelines. A major initiative in the Plan is a National Campaign to encourage states to adopt improved one-call systems. At present, 4 states do not have one-call legislation; 23 states with legislation do not have mandatory membership; and at least 30 states do not have the level of civil penalty authority mandated by Congress in 1988 (see Attachment 2). As a result of deficiencies identified in our annual evaluation of the New Jersey pipeline safety program, I understand that the BRC is considering draft legislation to strengthen the state's one-call system.

I will be appearing on a panel on May 4 at the One-Call Systems and Damage Prevention Symposium in Minneapolis, Minnesota, sponsored by the American Public Works Association. Some 700 one-call system managers, excavators, underground utility operators, and regulators are expected to attend this symposium. One week later, on May 10-11, we are holding our Pipeline Safety Advisory Committee meeting in Washington, DC. One half-day of the 2-day meeting will be spent dealing with one-call notification systems. We are looking at the symposium and Advisory Committee meeting as an opportunity to identify actions necessary to strengthen one-call systems and to finalize the components of our One-Call National Campaign, based on input from interested parties.

Prior to the symposium, RSPA has identified several campaign components including:

- Analyzing national and state accident statistics to validate the extent of outside force damage as an accident cause;
- Documenting the degree to which accident reduction can be attributed to expanded use of one-call systems;
- Targeting states for concentrated outreach to assist in their efforts to upgrade one-call systems;

- Reviewing existing Federal one-call legislation and regulations;
- Recommending changes to improve one-call effectiveness; and
- Furthering public education and awareness initiatives of the American Gas Association, American Petroleum Institute, Interstate Natural Gas Association of America, and other industry associations, including the possible development of public service announcements urging use of one-call systems.

We believe a model state one-call system has four key features:

- Mandatory participation by all underground facility operators in the state;
- No exceptions for any type or class of excavators;
- Meaningful, easily enforced sanctions against violators; and
- Aggressive promotion of public awareness of the benefits of "calling before you dig."

The One-Call National Campaign is being given priority attention as an initiative in the Department's Strategic Plan under Goal 4, to promote safe and secure transportation. Of all the pipeline safety initiatives in the Strategic Plan, improving one-call systems may potentially have the highest payoff in terms of reducing pipeline fatalities, injuries, and property damage.

Detection. Smart pigs provide an effective, though relatively new, technology for determining pipeline integrity, particularly in populated and environmentally sensitive areas. Last week, RSPA issued a final rule requiring that new and replaced gas transmission and hazardous liquid pipelines be capable of accommodating the passage of smart pigs.

Under the Pipeline Safety Act of 1992, RSPA has begun a rulemaking project to prescribe the circumstances under which smart pigs, or other inspection methods at least as effective as smart pigs, are to be used for the periodic inspection of pipelines in populated or environmentally sensitive areas. The rulemaking is being accelerated as a result of actions being taken to address environmental concerns following the March 1993 Colonial pipeline accident.

VII. Statistics on Cause of Accidents, by Class Location

In response to the Committee's request, we are providing statistics on causes of gas transmission incidents, by class location (see Attachments 3 and 4). Four class location designations are used to indicate the population density of the area surrounding a gas pipeline. A Class 1 location is the most sparsely populated; while a Class 4 location is the most densely populated.

The highest incidence of gas transmission pipeline failures from the period 1984-1993 was in sparsely populated Class 1 and 2 locations. In contrast, gas distribution pipeline failures are more likely to occur in Class 3 locations. This difference reflects the fact that transmission lines are typically located in rural areas, whereas distribution lines are generally found in urban areas.

VIII. Rulemakings Underway Addressing Circumstances of Incident

The most recent amendments to the Natural Gas Pipeline Safety Act of 1968, contained in the Pipeline Safety Act of 1992, require several rulemakings that address issues in the Texas Eastern failure. RSPA is preparing regulations requiring gas transmission operators to identify and accurately map pipelines passing through high-density population areas, and regulations

requiring operators of gas transmission pipelines to test and certify employees to assure their ability to recognize and react to both normal and abnormal operating conditions.

IX. Recommendations of Policy/Legislative Change

With respect to policy changes, within the Department of Transportation, we need to advance the realization that pipelines are a mode of transportation with the full range of operating considerations in supplying commodities to customers safely and efficiently. Unfortunately, this fact has been largely overlooked in both the Executive Branch and Congress. Unlike many modes, pipeline transportation is entirely privately capitalized -- decisions about maintenance and operations are determined based on profitability, return on investment, and tax consequences; there are no subsidies or grants for enhancing the pipeline infrastructure.

Managing the effect of time and the operating environment on steel or cast iron pipe is the critical issue for pipeline operations today. There is no question that the infrastructure is aging -- but we do not know where and to what degree the damage is likely to be the greatest. While diagnostic technology is available, its availability is limited and it is costly. We need to be risk-focused in requiring testing, a fact recognized in the Pipeline Safety Act of 1992.

RSPA and the American Petroleum Institute are supporting a joint effort to develop a model that could be used by pipeline operators for identifying risks and their solutions and for prioritizing the solutions to provide the optimal reduction in risk. The model will provide operators with opportunities for flexibility and innovation in reducing risk, recognizing that the action appropriate to reduce a specific risk may vary for each pipeline or segment of pipeline. If the model is successful, RSPA will consider basing inspections on an audit of an operator's risk assessment and management program as a possible alternative to rigid requirements in the pipeline safety regulations. Once operational, this model could be adapted for use by natural gas operators.

In keeping with our emphasis on risk management, we are also looking at developing scenarios similar to the Texas Eastern explosion for other highly populated communities to increase our understanding of probability and consequence factors.

Mandatory participation in one-call systems by all underground facility operators and excavators would go a long way toward improving the effectiveness of these systems to prevent accidental excavator dig-ins. To the extent any additional legislative authority is necessary, it should allow states flexibility in achieving the objectives of a model one-call system -- mandatory participation, no exceptions for excavators,

easily enforced sanctions, and increased public awareness. In the meantime, voluntary participation should be actively promoted through enhanced public education and outreach efforts.

To spur state outreach activity, we are exploring the allocation of grant funds for development and establishment of one-call systems under authority initially provided in the Pipeline Safety Reauthorization Act of 1988.

X. Closing

To reduce the risk to public safety and the environment from pipelines, we must maximize appropriate expertise in government and industry. We must work together to understand emerging trends, solve safety and environmental problems, and set program priorities, based on real rather than perceived risk, within available resources.

Because the problems are complex, and the mitigating resources limited, RSPA, the states, local governments, and industry must strive to pursue the same goals. Like other witnesses here today, RSPA is very concerned about the Texas Eastern rupture and the issues it raises. We are prepared to take the steps necessary to lessen the risks posed by pipelines and to do so in concert with Congress, the states, local governments, and industry. I would be pleased to answer any questions.

**Pipeline Accidents Reported to OPS in 1991
Caused by Damage from Outside Forces**

	<u>No. of Accidents</u>	<u>Fatalities</u>	<u>Injuries</u>	<u>Property Damage (Million)</u>
Gas Distribution	102	8	40	\$ 5.78
Gas Transmission/Gathering	37	0	4	2.68
Hazardous Liquid	<u>46</u>	<u>0</u>	<u>0</u>	<u>8.56</u>
Total	185	8	44	\$17.02
Total (All Causes)	443	14	97	\$44.47
Percent/Outside Forces	42%	57%	45%	38%

**Pipeline Accidents Reported to OPS in 1992
Caused by Damage from Outside Forces**

	<u>No. of Accidents</u>	<u>Fatalities</u>	<u>Injuries</u>	<u>Property Damage (Million)</u>
Gas Distribution	56	5	35	\$ 3.00
Gas Transmission/Gathering	30	3	5	11.98
Hazardous Liquid	<u>48</u>	<u>0</u>	<u>8</u>	<u>34.32</u>
Total	134	8	48	\$49.30
Total (All Causes)	403	20	125	\$95.76
Percent/Outside Forces	33%	40%	38%	51%

**Pipeline Accidents Reported to OPS in 1993
Caused by Damage from Outside Forces**

	<u>No. of Accidents</u>	<u>Fatalities</u>	<u>Injuries</u>	<u>Property Damage (Million)</u>
Gas Distribution	69	8	32	\$11.25
Gas Transmission/Gathering	34	0	2	9.24
Hazardous Liquid	<u>57</u>	<u>0</u>	<u>1</u>	<u>14.56</u>
Total	160	8	35	\$35.05
Total (All Causes)	454	14	111	\$67.40
Percent/Outside Forces	35%	57%	32%	52%

ONE-CALL NOTIFICATION SYSTEMS

States Not Having Legislation (4)

**Alabama
Hawaii**

**Texas
West Virginia**

States Having Legislation But Not Mandatory Membership (23)

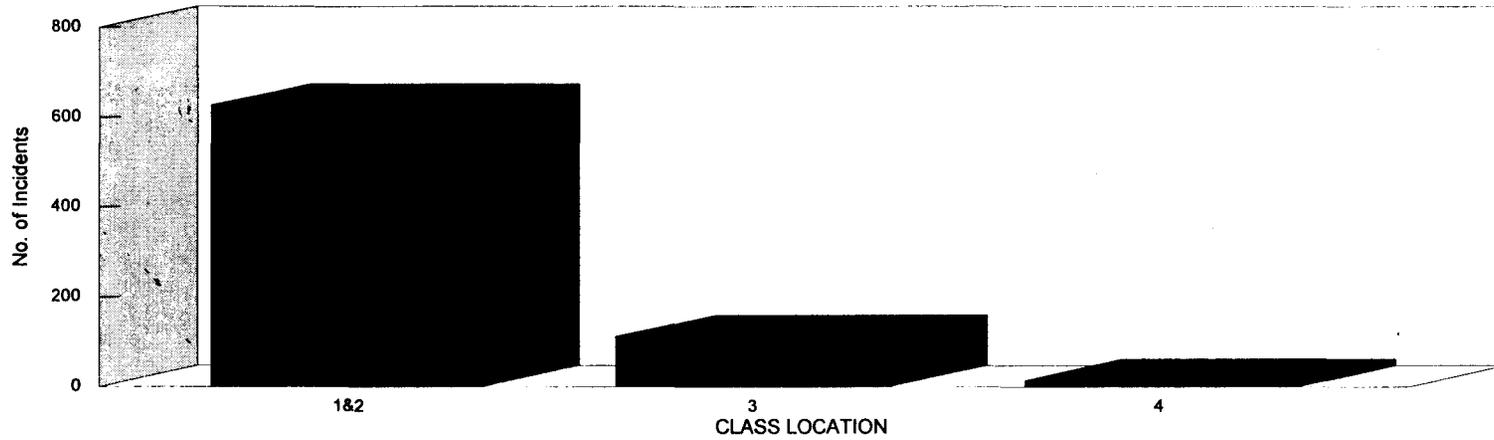
**Alaska
Colorado
Delaware
Indiana
Kansas
Maine
Mississippi
Missouri
Montana
Nevada
New Jersey
New Mexico**

**New York
North Carolina
North Dakota
Oklahoma
Oregon
South Carolina
South Dakota
Tennessee
Utah
Wisconsin
Wyoming**

**Source: Excavator's Damage Prevention Guide and One-Call
Systems International -- 1993-1994 Directory**

Total Transmission Incidents By Class Location: 1&2, 3, 4

1984-1993

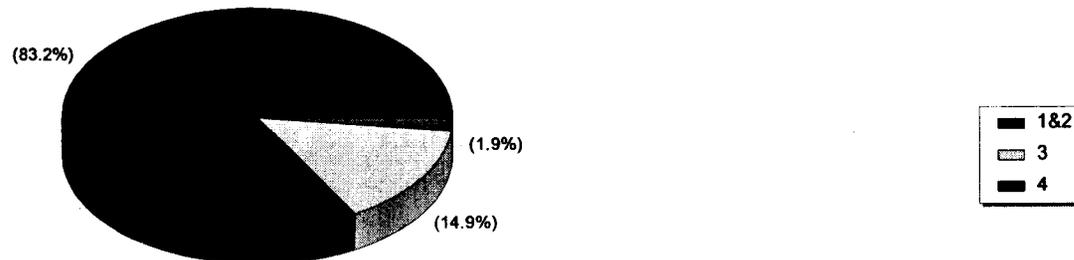


Total Transmission Incidents By Class Location: 1&2, 3, 4
1984-1993

	No. of Incidents	Percentage
1&2	626	83.2
3	112	14.9
4	14	1.9
All Classes	752	100

Total Transmission Incidents By Class Location: 1&2, 3, 4

1984-1993

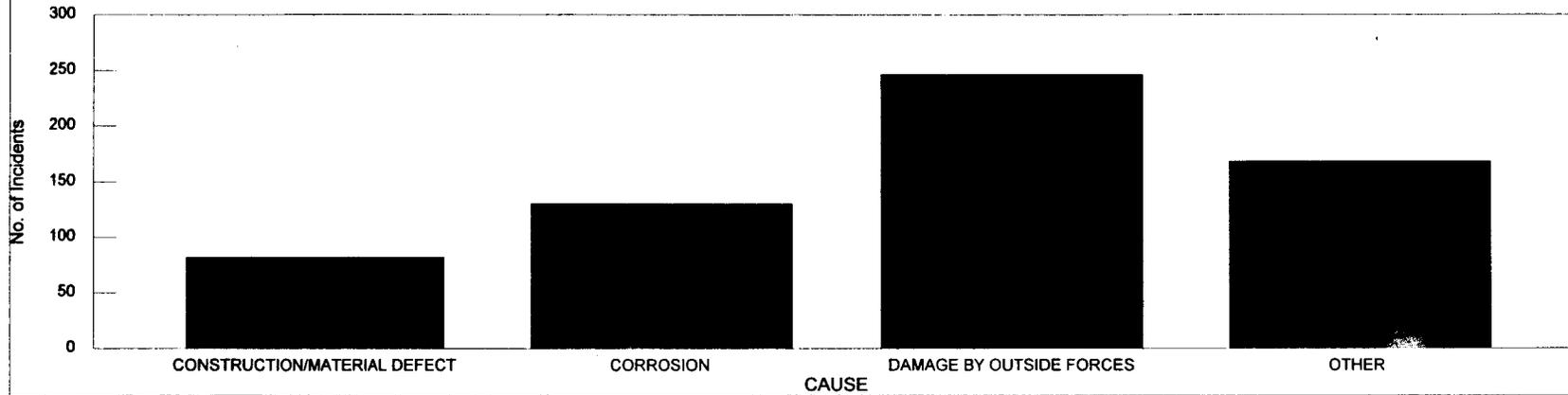


**Causes of Transmission Incidents: Class 1 and Class 2 Locations
1984 - 1993**

Cause	No. of Incidents
CONSTRUCTION/MATERIAL DEFECT	82
CORROSION	130
DAMAGE BY OUTSIDE FORCES	246
OTHER	168
Totals	626

Causes of Transmission Incidents: Class 1 and Class 2 Locations

1984 - 1993



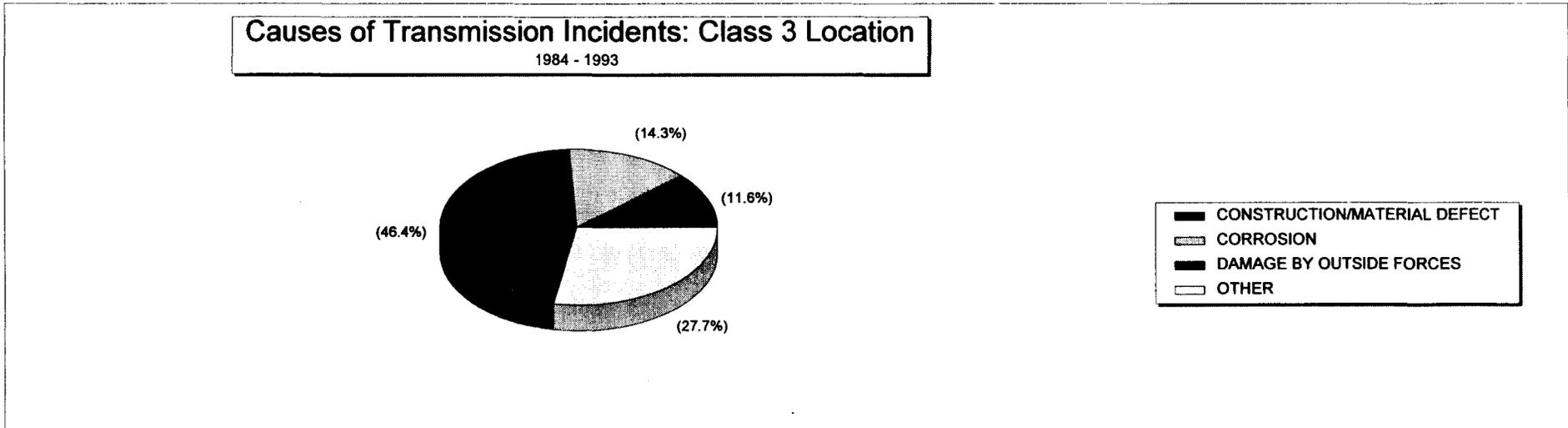
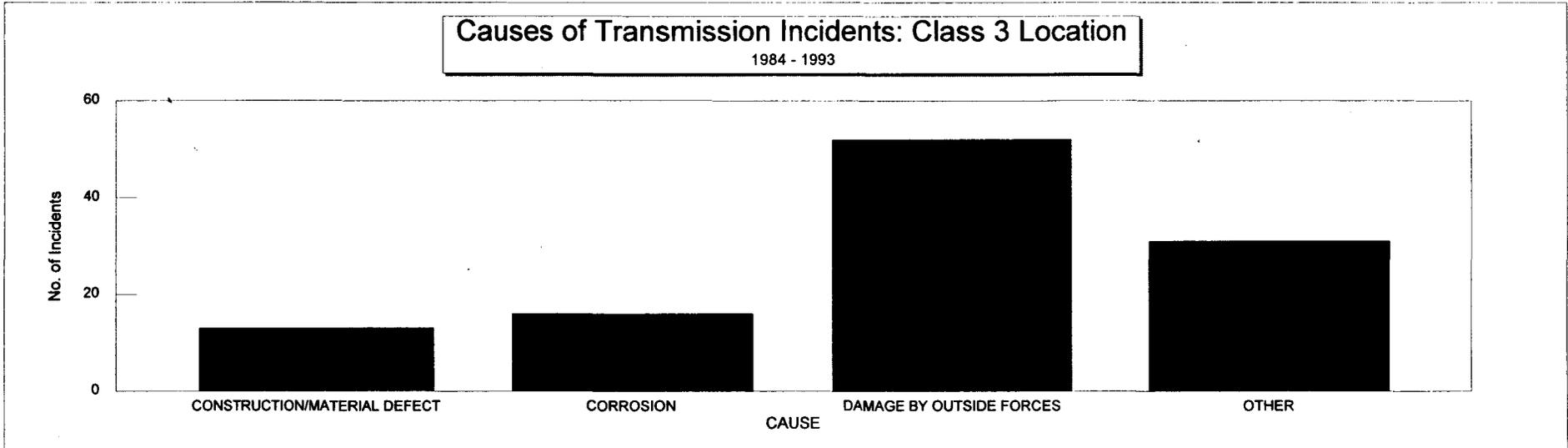
Causes of Transmission Incidents: Class 1 and Class 2 Locations

1984 - 1993



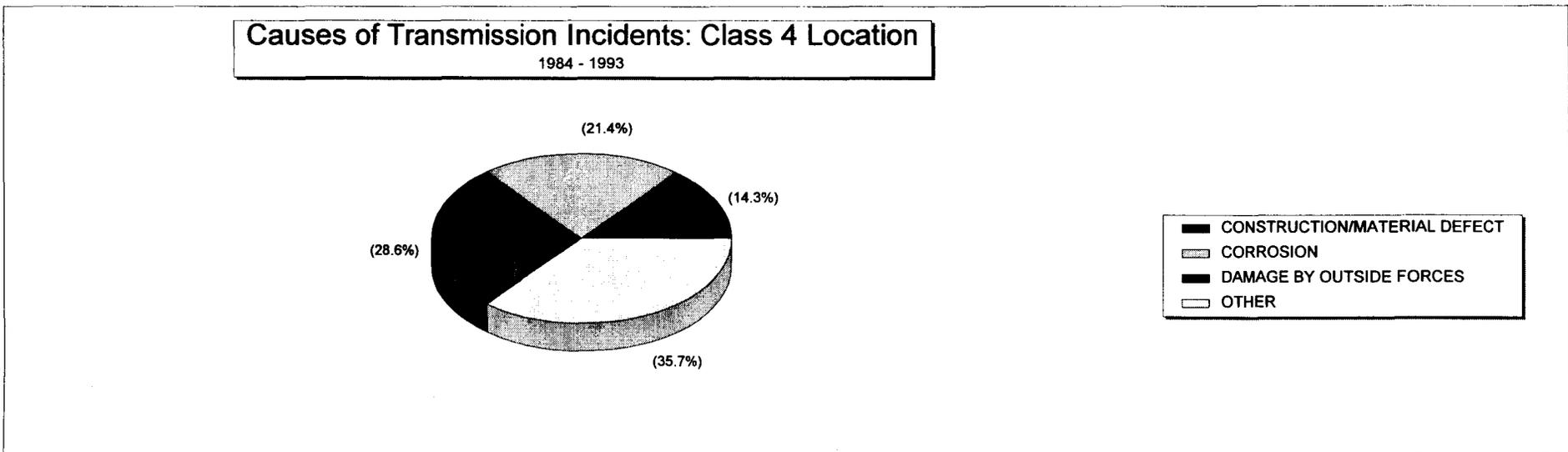
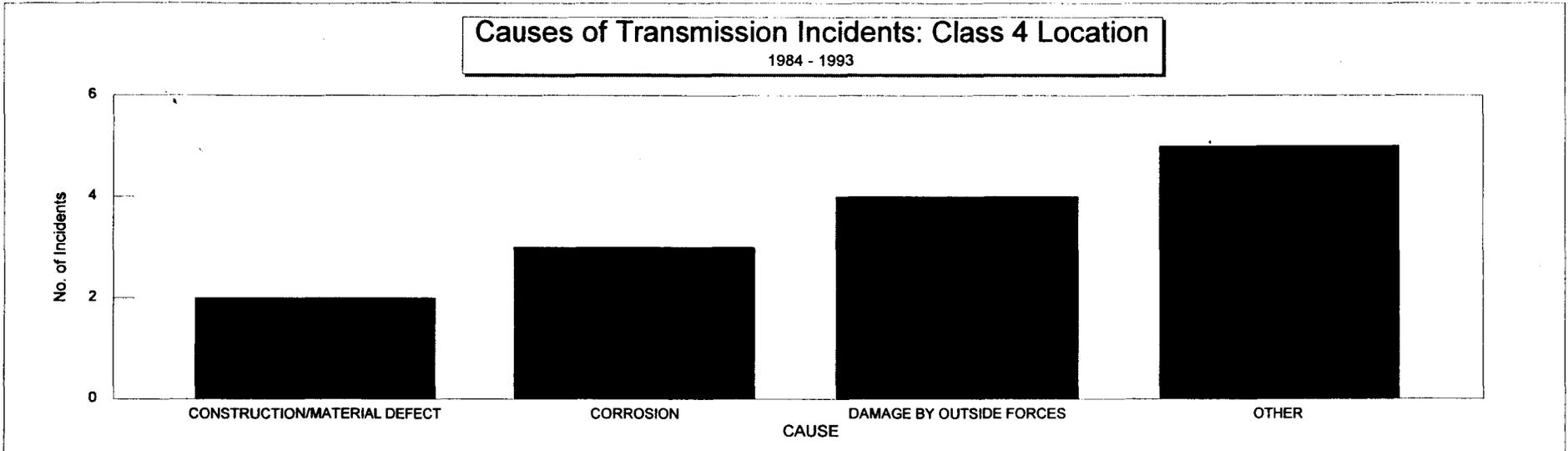
**Causes of Transmission Incidents: Class 3 Location
1984 - 1993**

Cause	No. of Incidents
CONSTRUCTION/MATERIAL DEFECT	13
CORROSION	16
DAMAGE BY OUTSIDE FORCES	52
OTHER	31
Totals	112



**Causes of Transmission Incidents: Class 4 Location
1984 - 1993**

Cause	
CONSTRUCTION/MATERIAL DEFECT	2
CORROSION	3
DAMAGE BY OUTSIDE FORCES	4
OTHER	5
Totals	14



SUMMARY OF NATURAL GAS
TRANSMISSION & GATHERING PIPELINE
INCIDENT REPORTS (DOT or RSPA F 7100.2)
RECEIVED IN 1993

INCIDENT SUMMARY BY CAUSE

CAUSE	# OF INCIDENTS	% OF TOTAL	PROPERTY DAMAGES	% OF TOTAL	DEATHS	INJURIES
Internal Corrosion	6	6.19	\$1,657,000	7.20	0	0
External Corrosion	8	8.25	\$1,292,876	5.61	0	1
Damage from Outside Forces	34	35.05	\$9,238,128	40.11	0	2
Construction/Material Defect	15	15.46	\$6,704,834	29.11	0	1
Other	34	35.05	\$4,137,000	17.96	1	16
TOTAL	97	100.00	\$23,029,838	100.00	1	20

SUMMARY OF NATURAL GAS
DISTRIBUTION PIPELINE
INCIDENT REPORTS (DOT or RSPA F 7100.1)
RECEIVED IN 1993

INCIDENT SUMMARY BY CAUSE

CAUSE	# OF INCIDENTS	% OF TOTAL	PROPERTY DAMAGES	% OF TOTAL	DEATHS	INJURIES
Internal Corrosion	0	0.00	\$0	0.00	0	0
External Corrosion	7	5.88	\$195,100	1.28	2	10
Damage from Outside Forces	69	57.98	\$11,252,150	73.58	8	32
Construction/Material Defect	8	6.72	\$701,000	4.58	0	6
Accidentally Caused by Operato	9	7.56	\$234,000	1.53	0	12
Other	26	21.85	\$2,910,405	19.03	3	20
TOTAL	119	100.00	\$15,292,655	100.00	13	80

