Subject Matter Study Report

**U.S. Department of Transportation Regulatory Evaluation of**

**Amendment 192-102**

March 15, 2021

By

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**Executive Summary**

At some unstated time prior to March 2006, the Pipeline and Hazardous Materials Safety Administration (PHMSA) of the U.S. Department of Transportation (U.S. DOT) performed a regulatory evaluation of proposed revisions in gas gathering line regulations designated as Docket RSPA-1998-4868.

Background information stated in this PHMSA evaluation and my comments on the evaluations included:

1. Gathering lines are pipelines used to collect and transport natural gas from the well and related production facilities to gas transmission or gas distribution pipelines. (Seldom, if ever, are gathering lines connected directly to distribution pipelines.)
2. In 1992, Congress provided U.S. DOT specific authority to define gas gathering for regulatory purposes.
3. The 1992 statutory change also directed the U.S. DOT to consider the function and operational characteristics of the lines in defining gathering lines and to consider such factors as location, length of line from the well site, operating pressure, throughput, and the composition of the gas. (This was disregarded by PHMSA.)
4. Within the limits of an incorporated or unincorporated city, town, or village, or in any designated residential or commercial area such as a subdivision, business or shopping center, or community development, current regulations require these gathering lines comply with requirements of transmission lines.
5. PHMSA indicated concern that “There is not always agreement as to when an area meets the rural and non-rural criteria.”
6. PHMSA stated that Title 49 CFR Part 192 did not define gas gathering lines, except by comparison to transmission lines. (This is untrue. Gathering line has been defined for many years as “a pipeline that transports gas from a current production facility to a transmission line or main”. Why be untruthful?)
7. PHMSA stated that transmission lines are defined as pipelines used in the transportation of gas, but which are not gathering lines. (This is not a complete definition of a transmission line. The definition also includes operation at a hoop stress of 20% of SMYS or more.)
8. PHMSA believed that most states include intrastate gathering lines in their pipeline safety inspection programs. (However, no specific information was provided to support this opinion by PHMSA.)
9. Confusion regarding the criteria to define gathering lines will result in inconsistencies in how regulations are enforced. The proposed rules aim to eliminate inconsistencies by providing a consistent definition of regulated gathering lines. (The new rules did not eliminate the confusion and did not comply with the 1992 statute.)
10. The proposed new rules comply with the 1992 Pipeline Safety Act (PSA 1992). (Not true, because length of line from the gas well site, operating pressure, throughput, and composition were not addressed in the new rules.)
11. The regulations do not now specify requirement specific to gathering lines. (Not true. Regulated gathering lines were required to meet all requirements applicable to transmission lines.)
12. Traditionally, most gathering lines have been smaller in diameter, some as small as two inches in diameter. Gathering lines typically operate at much lower pressure than transmission lines.
13. Gathering lines typically consist as a network of pipelines connecting individual wells or production fields in a limited geographic area and are mostly located in very rural areas.
14. Requiring application of safety regulations established for transmission pipelines to gathering lines will impose an unnecessary burden on operators of gathering lines. (No proof is provided to support this anti-regulation opinion.)
15. Application of a more limited set of focused safety requirements for gathering pipelines would result in reduced costs with increased safety for gathering lines. (This is preposterous. Why have any pipeline safety regulations if this is true?)
16. A risk-based classification system would efficiently target gathering lines that pose higher risks to public safety. (Why didn’t PHMSA propose an integrity management program for gathering lines? This was not prohibited by the Pipeline Safety Acts.)
17. The proposed safety rules classify which gathering lines are subject to safety regulation based on the consequences of an incident. (Failure to address line length from the gas well, operating pressure, throughput, and composition were significant failures to comply with PSA 1992.)
18. Implementation of the proposed regulations will reduce compliance costs to gas pipeline operators. (This addresses the primary concern of the gas pipeline industry. Did the gas pipeline industry write this regulatory evaluation for PHMSA? Public Safety, worker safety, and environmental protection appear to be minor considerations and priorities of PHMSA.)

PHMSA grossly failed to comply with Docket RSPA-1998-4868. The lack of action by PHMSA has resulted in may thousands of miles of large, high pressure, very dangerous, unregulated gas pipelines. PHSMA was apparently motivated by uncertainty in whether budgets would be adequate to regulate this massive number of pipelines.

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**Introduction**

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**Regulatory Assessment**

This PHMSA document indicated that Federal Executive Order 12866 directed all Federal agencies to develop both preliminary and final regulatory analysis if:

1. The proposed regulations are likely to be “significant regulatory actions” that have an annual economic impact of $100 million.
2. The proposed rule could adversely affect the economy or a sector of the economy in terms of:
	1. Productivity and employment;
	2. The environment;
	3. Public health;
	4. State; or
	5. State, local, or tribal governments.
3. An economic analysis of the proposed regulatory change must be made as required by sections 1a. and 1b. of the Executive order.

Section 1a. of Executive Order 12866 on regulatory philosophy required:

1. Federal agencies should promulgate only such regulations as are:
	1. Required by law;
	2. Necessary to interpret the law; or
	3. Necessary to protect the health and safety of the public, the environment, or the well-being of the American people.
2. Agencies should assess all costs and benefits of regulatory alternatives, including the alternative of no regulation.
3. Costs and benefits shall be understood to include both quantifiable and qualitative measures, even if they are difficult to quantify, but are essential to consider.
4. Agencies should select the regulatory approach that maximizes net benefits to protect the health and safety of the public, the environment, and the well-being of the American people, unless a statute requires another approach.

Section 1b. of Executive Order 12866 on principles of regulation on economic analysis required:

1. Each agency shall identify the problem to be addressed by regulatory action and the significance of the problem.
2. Each agency shall examine whether existing regulations (or other law) have created or contributed to the problem that a new regulation is intended to correct.
3. Each agency shall examine whether existing regulation shall be modified to achieve the intended goal of regulation more effectively.
4. Each agency shall identify and assess available alternatives to direct regulation.
5. Each agency shall consider to the extent reasonable, the degree and nature of the risks posed by various substances or activities within its jurisdiction.
6. Each agency shall tailor its regulations to impose the least burden on society, including individuals, businesses of different sizes, and other entities (including small communities and governments).
7. In choosing among alternative regulatory approaches, agencies should select those approaches that maximize net benefits, including potential economic, environmental, public health and safety, and other advantages; distributive justice impacts; and fairness or equity.
8. Each agency shall identify and assess available alternatives to direct regulation, including providing economic incentives to encourage the desired behavior such as user fees, permits, or providing information for the public to make informed choices.
9. In considering the cost-effectiveness of regulation, each agency shall consider the costs of enforcement and compliance to the government, regulated entities, and the public.
10. Each agency shall base its decisions on the best reasonably objective scientific, technical, economic, and other information concerning the need for, and consequences of, the intended regulation.
11. If regulatory action is taken, the most cost-effective manner should be taken to achieve the regulatory objective.
12. Each agency shall specify performance objectives rather than specifying the behavior or manner of compliance.
13. Each agency shall avoid regulations that are inconsistent, incompatible, or duplicative with other regulations or those of other Federal agencies.
14. Where some costs and benefits are difficult to quantify, a reasoned determination can be made on whether the regulatory action justifies the cost of the regulation.
15. Regulations shall be easy to understand with the goal of minimizing the potential for uncertainty.

PHMSA’s compliance and noncompliance with Executive Order 12866 was as follows:

1. PHMSA did not identify all the regulatory alternatives.
2. PHMSA did not define and assess all the costs and benefits of regulatory alternatives. PHMSA did not consider the net economic effects of pipeline compliance costs on the economy from pipeline contractor activities and compliance materials.
3. PHMSA did not consider ASME B31.8 on compliance requirements for gas gathering lines. ASME B31.8 does not exclude gas gathering lines from compliance requirements.
4. PHMSA failed to comply with PSA 1992 in at least the following areas:
	1. Length of gathering lines from gas well sites,
	2. Operating pressure,
	3. Throughput, and
	4. Composition.
5. PHMSA failed to consider a determination of when gas transmission facilities begin.
6. It is more important to define the scope of regulations than the non-regulatory scope. Why wasn’t this approach taken?

**Analysis of Reported Gas Pipeline Incident Data**

Five reports that contain data on incidents of gas pipeline ruptures are:

1. Unnumbered AGA report by Gideon, Kiefner and Smith of Battelle on gas transmission and gathering pipeline incidents during 1970-1973;
2. AGA Report No. 158 on gas transmission and gathering pipeline incidents during 1970 through June 1984;
3. AGA Report No. 200 on gas transmission and gathering pipelines, June 1984 through 1990;
4. AGA Report No. 213 on gas transmission and gathering pipeline, June 1984 through 1992; and
5. PRC Report PR-218-9406 on gas transmission and gathering pipeline incidents during January 1, 1985 through December 31, 1994 (see Table 1).

*Unnumbered AGA Report*

Relevant information on the effects of stress level on reported to DOT pipeline incidents was:

1. During 1970-1973 (four years), about 36% of the ruptures due to outside forces occurred at a hoop stress of less than 3 ksi. About 50% of the ruptures due to outside forces occurred at a hoop stress of 4-5 ksi or less. About 80% of the ruptures due to outside forces occurred at a hoop stress of 12-15 ksi or less.
2. During 1970-1973, about 10% of the ruptures due to corrosion and about 8% of the ruptures due to construction or material defect occurred at a hoop stress of 1ess than 3 ksi. About 50% of the ruptures due to corrosion occurred at a hoop stress of 9-12 ksi or less.
3. During 1970-1973, about 50% of the ruptures due to construction or material defect occurred at a hoop stress of 12-15 ksi or less.
4. During 1970-1973, about 40% of the leaks due to outside forces occurred at a hoop stress of 1ess than 3 ksi. About 50% of the leaks due to outside forces occurred at a hoop stress of 3-6 ksi or less. About 80% of the leaks due to outside forces occurred at a hoop stress of 9-12 ksi or less.
5. During 1970-1973, about 18% of the leaks due to corrosion occurred at a hoop stress of 1ess than 3 ksi. About 50% of the leaks due to corrosion occurred at a hoop stress of 4-7 ksi or less. About 80% of the leaks due to corrosion occurred at a hoop stress of 9-12 ksi or less.
6. During 1970-1973, about 15% of the leaks due to construction or material defect occurred at a hoop stress of less than 3 ksi. About 50% of the leaks due to construction and material defects occurred at a hoop stress of 18-21 ksi or less. About 80% of the leaks due to construction and material defects occurred at a hoop stress of 27-30 ksi or less.
7. During 1970-1973, 1635 incidents were reported. Incident causes were:
8. Corrosion – 247 (15.1%),
9. Outside forces – 886 (54.2%),
10. Material failure – 299 (18.3%),
11. Construction defect – 86 (5.2%),
12. Other – 117 (7.2%), and
13. Total 1635 (100%).
14. Fifteen (15) out of 1635 incidents were reported at occurring above the MAOP for the failed piping.
15. Over 70% of all incidents occurred at stress levels below 40% SMYS for Grade B pipe.
16. On the effects of failure stress level, this report contained the following statements:
17. Without the knowledge of the mileage operated at the various stress levels, it is not possible to evaluate completely the effect of stress upon the frequency of incidents.
18. Nevertheless, these data suggest that the number of incidents that occurred would not have been appreciably diminished if the allowable stress levels had been lowered.
19. The above comments are not consistent with the reported incident data. A primary cost and profit issue for pipeline companies is the allowable stress level and wall thickness of the line pipe. Pipeline companies have aggressively supported current stress limits and have recently obtained an increase in operating stress level to 80% SMYS for remote areas.
20. The estimated percent of incidents versus stress level for ruptures from figure 9 in the subject unnumbered AGA report were:

Percent of Incidents – Ruptures

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Hoop Stress ksi | Corrosion | Outside Forces | Const. Defect/Matl. Failure | Total |
| 1-3 |  10 |  36 |  8 |  18.0 |
| 3-6 |  10 |  5 |  12 |  9.0 |
| 6-9 |  10 |  14 |  10 |  11.3 |
|  9-12 |  20 |  19 |  3 |  14.0 |
| 12-15 |  5 |  8 |  13 |  8.7 |
| 15-18 |  5 |  3 |  10 |  6.0 |
| 18-21 |  4  |  3 |  5 |  4.0 |
| 21-24 |  8 |  2 |  4 |  4.7 |
| 24-27 |  9 |  3 |  6 |  6.0 |
| 27-30 |  1 |  3 |  6 |  3.1 |
| 30-33 |  2 |  1 |  6 |  3.0 |
| 33-36 |  5 |  1 |  13 |  6.3 |
| 36-39 |  5 |  1 |  1 |  2.3 |
| 39+ |  7 |  1 |  4 |  4.0 |
| Totals | 100 | 100 | 100 | 100 |

1. The percent of incidents versus stress level for leaks from figure 8 in the subject unnumbered AGA report were:

Percent of Incidents – Leaks

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Hoop Stress ksi | Corrosion | Outside Forces | Const. Defect/Matl. Failure | Total |
| 1-3 |  18 |  40 |  15 |  24.3 |
| 3-6 |  24 |  8 |  10 |  14.0 |
| 6-9 |  30 |  14 |  4 |  16.0 |
|  9-12 |  10 |  20 |  10 |  16.7 |
| 12-15 |  3 |  2 |  9 |  4.7 |
| 15-18 |  2 |  4 |  2 |  2.7 |
| 18-21 |  2 |  3 |  2 |  2.3 |
| 21-24 |  2 |  2 |  4 |  2.7 |
| 24-27 |  2 |  2 |  8 |  4.0 |
| 27-30 |  2 |  1 |  11 |  4.7 |
| 30-33 |  1 |  1 |  10 |  4.0 |
| 33-36 |  1 |  1 |  6 |  2.7 |
| 36-39 |  1 |  1 |  4 |  2.0 |
| 39+ |  2 |  1 |  3 |  2.0 |
| Totals | 100 | 100 | 100 | 100 |

1. The above tables clearly indicate that about half of the gas pipeline incidents occurred at low to moderate stress levels and the current codes and regulations should have eliminated or at least modified their exemptions of pipeline requirements based on stress levels.
2. The number of incidents versus stress level is not consistent with logic, because one would expect hoop stress level to have a dominating effect on increasing pipeline incidents.
3. The rupture data supports one or more of the following conclusions:
4. Gas pipeline companies place considerably more attention to incident prevention of highly hoop stressed pipelines than to low to moderately hoop stressed pipelines.
5. Conversely, gas pipeline companies place considerably less attention to incident prevention of low to moderately hoop stressed pipelines.
6. The origins of gas releases that caused incidents and test failures were:

Percent of Incidents or Test Failures

|  |  |  |  |
| --- | --- | --- | --- |
| Origin of Release | All Incidents | Outside Force Incidents | Test Failures |
| Pipe body | 54.2 | 64.7 | 30.4 |
| Girth weld |  6.2 |  2.4 |  6.9 |
| Pipe seam weld |  5.8 |  0.2 | 57.9 |
| Tap connection |  5.1 |  8.6  |  0.2 |
| Fitting | 13.7 | 13.4 |  2.3 |
| All others | 14.9 | 10.7 |  2.2 |

1. Some of and perhaps many of the incidents involving fittings were likely at tap locations on gas pipelines. The data indicate that tap connections on gas pipelines are not adequately marked and protected; therefore, inspection and construction oversight near pipeline connections need to be improved.
2. The number of pipe weld failures during pressure tests versus incidents validated the value of pressure testing in removing defective pipe longitudinal weld seams.

*AGA Report No. 158*

Relevant information on the effects of stress level on pipeline incidents and pressure test failures was:

1. 5872 in-service incidents were reported over about 14.5 years.
2. 2013 pressure testing incidents were reported over about 14.5 years.
3. 5610 in-service incidents reported contained enough information to determine if a leak or rupture was involved with the incidents.
4. 35.7% (2003) of the incidents were indicated as ruptures.
5. 9.2% (514) of the incidents were indicated as ruptures that propagated more than one foot along the pipe axis.
6. Five previous analysis of DOT gas pipeline incident data between 1970 through 1978 indicated that about one third of all reportable incidents were classified as ruptures.
7. The number of incidents involved with exceeding the MAOP of the piping was 4.4%. In 1982, about 28% of the reported incidents involved exceeding the MAOP of the piping.
8. During 1970-1984, 14.8% (867) of the 5861 total number of incident reports did not include information on the failure pressure of the piping. The DOT failed to require complete data in these and other incident reports.
9. The percentages of reported incidents versus stress level at failure were:

|  |  |
| --- | --- |
| Stress Level, ksi | Percent of Incidents |
| 0-3 | 22.2 |
| 3-6 | 16.8 |
| 6-9 | 13.3 |
|  9-12 |  8.0 |
| 12-15 |  6.3 |
| 15-18 |  3.4 |
| 18-21 |  2.6 |
| 21-24 |  2.9 |
| 24-27 |  2.0 |
| 27-30 |  1.7 |
| 30-33 |  1.6 |
| 33-36 |  1.4 |
| 36-39 |  0.7 |
| 39+  |  2.4 |
| N.A.\* | 14.8 |

 \*Not available

1. Fifty-two and three tenths’ percent (52.3%) of all incidents occurred at a hoop stress of 9 ksi or less. For incidents with reported failure stress data, 61.4% (52.5% ÷ 0.852) of the incidents occurred at a hoop stress of 9 ksi or less (17.3% or less SMYS in X-52 pipe).
2. The data on reported incidents versus failure stress level clearly show that stress level by itself is a poor criterion for allowing exemptions on pipeline safety requirements.
3. The percentages of reported pressure testing failures versus failure stress level for 1970 through 1982 were:

|  |  |
| --- | --- |
| Stress Level, ksi | Percent of Incidents |
| 0-3 |  2.0 |
| 3-6 |  2.6 |
| 6-9 |  1.9 |
|  9-12 |  2.7 |
| 12-15 |  3.0 |
| 15-18 |  2.7 |
| 18-21 |  5.1 |
| 21-24 |  3.9 |
| 24-27 |  3.4 |
| 27-30 |  3.8 |
| 30-33 |  7.5 |
| 33-36 |  5.1 |
| 36-39 |  6.3 |
| 39+  | 47.5 |
| N.A.\* |  2.7 |

 \*Not available

1. Test incidents versus stress level should have been reported for increments of stress level above 39 ksi to more clearly show the effects of test stress level.
2. The pressure testing failure versus stress level shows the benefits of pressure testing at higher stress levels than lower stress levels.
3. During 1970-1984, 62.5% of the reported in-service incidents occurred in the body or longitudinal weld of line pipe. Six percent (6%) of the incidents occurred in girth welds. Fifteen and six tenths’ percent (15.6%) of the incidents occurred in tap connections and fittings. Scraper traps were only associated with 0.1% of the incidents. Two and seven tenths’ percent (2.7%) of the incidents were associated with valves.
4. The DOT incident report categories on “part of system which leaked or failed” and “origin of leak or failure” were inadequate to describe the types of facilities associated with incidents.
5. This report also included an inappropriate comparison of transportation fatalities with other modes of transportation including:
6. Passenger cars,
7. Large trucks,
8. Pedal cycles,
9. Motorcycles,
10. Pickup trucks and vans,
11. Pedestrians,
12. Railroad,
13. Airlines,
14. General aviation,
15. Marine, and
16. Recreational.
17. The comparison should have only included bystanders killed by freight transportation means to be more realistic. Pipelines do not transport people.
18. In 1983, there were 46,115 transportation related deaths. Sixteen were due to pipeline incidents. Some later comparisons of pipeline caused fatalities only covered freight transportation.
19. The report was heavily biased in trying to show the positive side of gas pipeline transportation of which there were many. However, the pipeline industry showed no evidence of attempting to expand the data bases on pipelines to provide more cause and effect data needed for objective risk analysis and for evaluation of codes and regulations.

*AGA Report No. 200*

Relevant information on the effects of stress level on pipeline incidents included:

1. In July 1984, the DOT changed the incident definition to reduce the number of reported incidents. Incident reporting criteria was changed as follows:
2. The estimated property damage was to include the cost of lost gas and the amount of damage was increased from $5,000 or more to $50,000 or more.
3. Gas ignition reporting criteria was deleted.
4. Leaks requiring immediate repair were deleted from the incident reporting criteria.
5. Injuries requiring hospitalization were changed to injuries requiring in-patient hospitalization to eliminate injuries that received only hospital emergency treatment.
6. Pressure testing failures were deleted.
7. In July 1984, the amount of data required in incident reports was reduced.
8. Over the 6.5-year period, 536 onshore incidents and 85 offshore incidents were reported to the DOT.
9. Onshore incidents caused 118 injuries and 26 fatalities.
10. Offshore incidents caused 6 injuries and 18 fatalities.
11. During this period, gas pipelines received $42.5 billion in transportation revenue.
12. The percent of onshore gas pipeline incidents versus failure stress level were:

|  |  |
| --- | --- |
| Hoop Stress, % SMYS | Percent of Total |
| ­< 10% | 34.7 |
| > 10% to < 20% |  9.3 |
| > 20% to < 30% | 12.3 |
| > 30% to < 40% | 14.4 |
| > 40% to < 50% |  8.6 |
| > 50% to < 60% |  5.6 |
| > 60% to < 70% |  6.9 |
| > 70% to < 80% |  6.0 |
| > 80% to < 90% |  0.9 |
| > 90% to < 100% |  1.3 |

1. The percent of offshore gas pipeline incidents versus failure stress level were:

|  |  |
| --- | --- |
| Hoop Stress, % SMYS | Percent of Total |
| ­< 10% | 22.4 |
| > 10% to < 20% |  3.5 |
| > 20% to < 30% | 21.2 |
| > 30% to < 40% |  8.2 |
| > 40% to < 50% | 28.2 |
| > 50% to < 60% | 15.3 |
| > 60% to < 70% | 0 |
| > 70% to < 80% |  1.2 |
| > 80% to < 90% | 0 |
| > 90% to < 100% | 0 |

*AGA Report No. 213*

Relevant information on the effects of stress level on pipeline incidents reported for June 1984 through 1992 included:

1. Report was published July 1995.
2. Report covered eight and one-half (8.5) years of incidents.
3. Six hundred eighty-five (685) onshore incidents were reported.
4. One hundred ten (110) offshore incidents were reported.
5. These incidents caused 164 injuries and 47 fatalities.
6. Two hundred ten (210) onshore incidents resulted from ruptures and 249 resulted from leaks. Two hundred twenty-six (226) incidents could not be determined as leaks or ruptures because of inadequate report completion.
7. No analysis on the effects of stress level was included in the report.
8. For 629 incidents with enough information to make an analysis, 20 incidents (3.2%) occurred above the MAOP of the pipeline.

*AGA Report No. 218*

Relevant information on the effects of stress level on pipeline incidents reported for January 1, 1985 through December 31, 1994 is summarized in Table 1. The data in Table 1 are summarized as follows:

1. Report was dated May 31, 1996.
2. The effect of stress level was not covered in this report as was the case in numerous previous reports on analysis of gas pipeline incidents.
3. Eight hundred sixty-five (865) incidents were reported during this ten year period.
4. One hundred eighty-two (182) or 21% of the reported incidents were at compressor, meter, and pressure control stations.
5. Six hundred eighty-three (683) or 79% of the reported incidents involved piping or pipeline facilities between stations.
6. The causes of incidents were broken down in more categories than reported by the DOT.
7. The PRC report attempted to classify external force incidents as ruptures, punctures, tears, leak, or none although the DOT incident reports only covered rupture, leak, and other to describe the pipeline release condition.
8. This report included the individual data on each of the 865 incidents.
9. Enclosed is Table 1 that contains data on the incidents that reported a rupture length although PRC Report No. 218 attempted to classify some of the incidents as non-ruptures.
10. For example, the report classified incident No. 900214 as a 30-foot-long tear. Incident No. 890065 was classified as a 6-foot-long puncture. These incidents were probably ruptures due to their length.

**Analysis of Reported Petroleum Pipeline Incident Data**

Two reports that contain data on incidents of liquid petroleum pipelines are:

1. API Research Study #040 on a sample of incidents that occurred during 1968 through 1986.
2. API Publication 1158 on reported incidents that occurred during 1986 through 1996.

*API Research Study #040*

Relevant information in API Research Study #040 included:

1. Study was performed to examine the cost/benefit of several pipeline safety issues.
2. Study included only interstate hazardous liquid pipelines.
3. Questionnaire was completed by 99 companies on 206 pipeline systems covering 113,345 miles of onshore interstate pipelines.
4. Ten companies did not respond to the questionnaire.
5. It was believed that there were about 220,000 miles of hazardous liquid pipelines in the USA with about half being interstate and about half being intrastate.
6. On the sample average, pipelines were operating at 70% of capacity.
7. For 1968 through 1986, 4948 incidents were reported to the US DOT. Of these, 4118 occurred in piping segments and 830 occurred in pump stations, terminals, and tanks.
8. Three hundred twenty-nine (329) of the incidents were indicated as serious by causing 72 deaths, 184 injuries, and $30.63 M ($93,000 per incident) in property damage.
9. The study used a value of $2,000,000 on each life and $500,000 on each personal injury.
10. The report calculated the annual cost of hazardous pipeline incidents to be $18.86 M due to deaths, injuries, property damage, and lost transported liquids. No environmental costs were included. Litigation costs were not included.
11. Incident damage was divided by cause as:
12. Corrosion and defective pipe,
13. Third party,
14. Incorrect operation, and
15. Other.
16. The “other” category caused the most deaths of the four cause categories.
17. Table 10 in the report was a comparison of incident damage potential of pipelines versus railroads, motor carriers, and water carriers.
18. Table 10 did not include the effects of all the deaths, injuries, and property damage caused by pipelines.
19. Table 10 also lumped together the effects of railroads, motor carriers, and water carriers together. The data clearly shows that water carriers are safer than pipelines and motor carriers are less safe than other modes of transportation.
20. Intrastate pipeline deaths, injuries, and property damage were not excluded from Table 10.
21. This report contained no information on the effects of operating pressure or hoop stress on pipeline incidents.

*API Publication 1158*

Relevant information in API 1158 on the effects of hoop stress level is:

1. One thousand three hundred sixty-eight (1368) piping related incidents were reported and 894 non-piping incidents were reported.
2. Four hundred twenty-four (424) of the 1368 piping related incidents were not completed to indicate hoop stress data.
3. For the 944 incidents reports with hoop stress failure data, the effects of stress level were:

Number of Incidents

|  |  |  |
| --- | --- | --- |
| Stress Level% SMYS | Number | % of Total |
|  0 to 9.9 | 277 | 29.3 |
| 10 to 19.9 | 171 | 18.1 |
| 20 to 29.9 | 148 | 15.7 |
| 30 to 39.9 | 127 | 13.5 |
| 40 to 49.9 |  88 |  9.3 |
| 50 to 59.9 |  65 |  6.9 |
| 60 to 69.9 |  47 |  5.0 |
| 70 to 79.9 |  14 |  1.5 |
| 80 to 89.9 |  4 |  0.4 |
| 90 to 99.9 |  3 |  0.3 |

1. Forty-seven and four tenths’ percent (47.4%) of piping incidents occurred at 19.9% SMYS or less.

**Gathering Operating Pressure Failure**

PHMSA used a hoop stress level of 20% of specified minimum yield strength (SMYS) to address operating pressure issues addressed in PSA 1992. However, the operating pressures that correspond to 20% SMYS in standard weight, grade B pipe are:

1. For 4-inch nominal diameter pipe – 737 psig,
2. For 6-inch nominal diameter pipe – 592 psig,
3. For 8-inch nominal diameter pipe – 523 psig, and
4. For 10-inch nominal diameter pipe – 475 psig.

These are not low pressures as believed to be the case by PHMSA on gathering lines. The only types of other gas pipelines operating at low pressures are gas distribution pipelines. Title 49 CFR Part 192 limits the operating pressures of “high pressure” gas distribution mains to 60 psig. A much lower pressure than that corresponding to a hoop stress of 20% of SMYS is needed.

**Gathering Composition Failure**

The vast majority of gas gathering lines transport “wet”, not “dry” gas. Gas gathering lines carry substantial amounts of liquid hydrocarbons including those with vapor pressures less than atmospheric pressure. When leaks occur, gas gathering lines can also be a significant risk to the environment. Liquids in gas gathering lines have low viscosities and high transport properties through the soil and into the water table.

**Gathering Throughput Failure**

Gas gathering systems usually consist of a network of pipelines that connect gas wells to a liquid/gas separation facility for removal of liquid condensate hydrocarbons. Liquid condensate hydrocarbons are delivered to trucks or liquid hydrocarbon pipelines for further transportation. After separation, the higher vapor pressure fluids such as butanes and propanes, along with the more volatile fluids such as ethane and methane, are compressed and delivered to larger lines connected to gas transmission lines. Low operating pressures and low throughputs go together in gas gathering.

**Length of Line from Gas Well Failures**

PHMSA neglected to consider length of line from gas well in the definition of gathering lines and regulatory requirements. This requirement means the gas gathering line has to be connected to gas wells on one end and by necessity have to be connected to gas/liquid separation and compression facilities on the other end of each gathering line.

This PHMSA failure to clearly include this requirement in PSA 1992 has resulted in numerous gas transmission lines operating near 1,000 psig, larger than 8-inches and longer than 10 miles being reclassified as gas gathering lines.

**Office of Management and Budget Circular No. A-119**

Office of Management and Budget (OMB) revised Circular No. A-119 in February 1998. This document established policies on Federal use and development of voluntary consensus standards and on conformity assessment activities. A-119 addressed policy on:

1. When must an agency use voluntary consensus standards,
2. What must an agency do when such use is determined to be inconsistent with applicable law or is otherwise impractical,
3. How this policy affects an agency’s regulatory authorities and responsibilities,
4. Goals of agency use of voluntary consensus standards,
5. Consideration an agency should make when considering using a standard,
6. Agency preference to performance standards,
7. Agency referencing of voluntary consensus standards,
8. Agency activities if no consensus standard exists,
9. Agency identification of consensus standards,
10. Purpose of agency participation on consensus standards activities,
11. General principles or agency support of consensus standards activities, and
12. Forms of agency support of consensus standards activities.

Information and guidance provided in A-119 included:

1. Goals on use of voluntary consensus standards included:
	1. Eliminate government cost of developing its own standards and decrease the burden of complying with government regulation,
	2. Provide incentives and opportunities to establish standards that serve national needs,
	3. Promote efficiency and economic competition through harmonization of standards, and
	4. Further reliance on the private sector to supply government needs.
2. The term “standard” or “technical standard” included:
	1. Common and repeated use of rules, conditions, guidelines or characteristics for products, processes, production methods, and related management systems practices.
	2. Additional definition and examples of standards include:
		1. Classifications of components;
		2. Delineation of procedures;
		3. Specification of dimensions, materials, performance, design, or operations;
		4. Measurement of quality or quantity in describing materials, processes, products, systems, services, or practices;
		5. Test methods and sampling procedures; and
		6. Description of fit and measurement of size or strength.
3. “Performance standard” is a standard as defined above that states the requirements in terms of required results with criteria for verifying compliance, but without stating the methods for achieving required results. A performance standard may define the functional requirements for the item, operational requirements, and/or interface and interchangeability characteristics.
4. A “prescriptive standard” may specify design requirements, such as materials to be used, how a requirement is to be achieved, or how an item is to be fabricated or constructed.
5. “Consensus” is defined as general agreement, but not necessary unanimity, and includes a process of attempting to resolve objections.
6. This policy applies to all agencies and agency employees.
7. An agency may use voluntary consensus standards in its regulatory activities unless use of such standards would be inconsistent with applicable law or is otherwise impractical.
8. A standard can be used in whole or in part.
9. Impractical includes circumstances in which such use would fail to serve the needs of agency’s programs, would be infeasible, inadequate, ineffectual, inefficient, or inconsistent with agency’s mission. Impractical includes standards which would impose more burdens, or would be less useful, than the use of another standard.
10. An agency should give preference to performance standards when such standards may reasonably be used in lieu of prescriptive standards.

Failures of PHMSA to comply with A-119 included:

1. Section 192.7 requires:
	1. Any documents or portions thereof incorporated by reference in 49 CFR Part 192 are included in 49 CFR Part 192 as though set out in full.
	2. When only a portion of a document is referenced, the remainder is not incorporated in this part.
2. The provisions of Section 192.7 are counterproductive, because references to a document within the regulations to clarify compliance source requirements will diminish the scope of compliance with the document. For example:
	1. Section 192.8 lists ASME B31.8 as a total incorporated by reference document.
	2. Section 192.619 on maximum allowable operating pressure references Section N5 of Appendix N of ASME B31.8.
	3. This seldom used reference to Appendix N of ASME B31.8 cancels the applicability of the remainder of ASME B31.8 to regulated pipelines.
	4. This is an absurd regulatory position to take.
	5. Although one can debate the adequacy of ASME B31.8, this document provides considerable compliance details that augment the minimally stated requirements in 49 CFR Part 192.
	6. When will the U.S. DOT “wake up”?

PHMSA failed to consider the requirements of OMB A-119 in the regulatory analysis of their regulatory proposal for gas gathering lines. More specifically, PHMSA failed to use ASME B31.8 which was already included into 49 CFR Part 192 as a referenced standard. However, PHMSA’s absurd restrictions on incorporated standards limited the regulatory compliance of gas gathering lines with ASME B31.8. OMP B-119 allowed PHMSA to incorporate ASME B31.8 in total as a regulatory requirement included requirements for gas gathering lines to comply with the same requirements as transmission lines.

**PHMSA Regulatory Alternatives**

PHMSA considered the following five alternatives.

1. No action.
2. Impose all requirements for trunklines onto gathering lines.
3. Define gas gathering lines different from that in American Petroleum Institute (API) Recommended Practice (RP) 80. (PHMSA referred to API RP 80 as a standard.)
4. Develop a whole new set of safety regulations applicable to gathering lines.
5. Adopt the API RP 80 definition of gathering line, define regulated gathering lines on the potential consequence of incidents, and apply current safety requirements to those regulated gathering lines.

For option 1, no action, PHMSA indicated the following opinions:

1. Gathering lines are not now defined clearly in the regulations.
2. Gathering lines are not presently subject to regulatory requirements unless they are in incorporated or unincorporated cities, towns, or villages or designated residential or commercial areas.
3. Current requirements are ineffective and inefficient. Ineffective, because it fails to provide necessary protection to persons near the pipeline not living in incorporated or unincorporated areas.
4. Current requirements are ineffective, because operators are required to implement measures on regulated gathering lines that are appropriate to pipelines that pose much greater risk.
5. Taking no action would not be responsive to the Congressional mandate to define gathering lines and establish appropriate requirements for regulated gathering lines.
6. For these reasons, the no action alternative was not considered.

Comments on PHMSA’s opinions on option 1 are:

1. The beginning of gas transmission lines are not defined clearly in the regulations.
2. If PHMSA had so much difficulty in defining the end point of gathering lines, why didn’t they consider defining the beginning of gas transmission lines?
3. PHMSA failed to define which specific regulatory requirements were ineffective and inefficient. Such data on gas gathering lines was unlikely to be available to PHMSA. This was likely an unsupported opinion of the gas pipeline industry.
4. PHMSA failed to consider ASME B31.8 which does not differentiate compliance requirements between gathering lines and transmission lines.

For option 2, apply transmission lines to all gathering lines, the following opinions were given:

1. This would eliminate the need to define where gathering lines cease.
2. It would take advantage of over 30 years of U.S. DOT experience in transmission line regulation to protect public safety.
3. Many gathering lines are small in diameter and operate at low pressure. These pipelines pose a much less risk than transmission lines.
4. Imposing transmission line requirements on all gathering lines would significantly increase their operating costs.
5. Many gas wells currently are “marginal producers”. Increasing operating costs would make it unprofitable to operate the wells.
6. For these reasons, the option of imposing transmission line requirements on all gathering lines was not evaluated further.

Comments on the above PHMSA information on option 2 are:

1. The ASME B31.8 Code already requires that gathering lines and transmission lines meet the same requirements.
2. PHMSA has never gathered and analyzed information and data on non-regulated pipelines and was totally dependent on the gas pipeline industry for data and information.
3. Since gas gathering pipelines in “rural” areas have never been required to report incidents and prepare annual reports, it is unlikely that the gas pipeline industry’s data was reliable and would be statistically biased on the low side to include major incidents known at the headquarters’ levels.
4. The incident data does not include liquid hydrocarbons volumes in leaks that should be reported under 49 CFR Part 195.
5. Pipeline safety acts have never prohibited the U.S. DOT from collecting information and data on rural gas gathering lines.

For option 3, developing a definition for gathering lines different from that in API RP 80, the following opinions were given:

1. This option would require PHMSA to evaluate the design and function of gas gathering systems.
2. PHMSA would need to define the functional point at which production, at the wellhead, is considered to give way to “gathering”.
3. PHMSA would also be required to define a point at which gathering ends and transmission begins.
4. A new PHMSA effort would ignore the work in API RP 80 and duplicate much of the work performed in API RP 80.
5. Performing this work would require a significant interaction with the pipeline industry.
6. The gas pipeline industry is uninterested in investing the time required to work with PHMSA on a new definition.
7. It is unlikely that a new effort would develop a significantly better or different definition.
8. For these reasons, the alternative of developing a wholly-new definition for gathering lines was not evaluated further.

Comments on the above PHMSA opinions on option 3 are:

1. The design and function of gas gathering system is not that complex.
2. The function point at which production at the wellhead gives way to gathering was somewhat defined in PSA 1992 as the gas wellhead.
3. In the final rule making in section 192.8(a)(4), the endpoint of gathering under section 2.2(a)(1)(D) of API RP 80 may not extend beyond:
	1. The furthermost downstream compressor used to increase gathering line pressure to delivery to another pipeline,
	2. Beyond the first downstream natural gas processing plant, and
	3. Beyond the point of commingling of gas from separate production fields if the production fields are more than 50 miles apart.
4. The consideration of commingling of gas production fields was not addressed in PSA 1992 and should not have been included into section 192.8(a).
5. PHMSA ignored the obvious issue of defining when gas transmission began.
6. Natural gas streams from wellheads that have undergone separation operations and been compressed for further transportation purposes can be used for gas distribution purposes if the gas distribution stream is maintained at pressures lower than the aggregate vapor pressure of the composite gas stream.
7. API RP 80 covers many options for defining gas gathering and thus creates more confusion than clarity on the definition of gas gathering.
8. Why is PHMSA worried about a significant interaction with the gas pipeline industry?
9. PHMSA exhibits little confident in its ability to define a better definition of “gas gathering”.
10. PHMSA did not need to develop a wholly-new definition of “gathering lines”.

For option 4, develop an entirely new set of regulations applicable to gas gathering lines, the following opinions were given:

1. Attempting to develop a new set of safety regulations would ignore the wealth of experience and development over time that are part of the current regulatory system.
2. Threats that affect gathering lines are the same as those that can affect other pipelines.
3. The principle causes of transmission pipeline accidents are corrosion and outside force damage, including excavation damage. These are the same major threats to gathering lines.
4. There is nothing about the design and operation of gathering lines that is so unique to give rise to new threats or to indicate that past practices, proven effective for transmission pipelines, would not be effective in protecting gathering lines.
5. Significant federal resources and time would be expended on developing a new set of regulations with little likelihood that they would be more effective than current requirements.
6. For these reasons, the alternative of developing a new set of safety regulations for gathering pipelines was not evaluated further.

Comments on the above opinions are:

1. PSA 1992 did not address a new set of regulations for gathering lines.
2. There was no need to consider this alternative.

For option 5, adopt the API RP 80 gathering line definition with minor changes and apply selected current regulations applicable to transmission pipelines as necessary to address risks, the following opinions were given:

1. The pipeline industry through API RP 80 has already defined gas gathering lines.
2. PHMSA can select from existing regulations to identify the necessary set of regulations for gathering lines.
3. This approach is most likely to result in appropriate safety requirements in the most efficient manner.

Comments on the above opinions include:

1. API RP 80 contains numerous criteria for determining the starting and end points of gathering lines.
2. Some definitions in API RP 80 do not comply with PSA 1992.
3. Following API RP 80 creates considerably more confusion on defining the start and end points of gas gathering lines.
4. Following API RP 80 allows the gas pipeline industry to classify gas transmission pipelines as gas gathering lines to minimize regulatory oversight.
5. The following requirements in 49 CFR Part 192 were excluded from compliance requirements of gas gathering lines:
	1. All gathering lines in Class 1 areas,
	2. Passage of internal inspection devices, and
	3. All requirements in Subpart O on pipeline integrity management.
6. Allow plastic piping in gas gathering lines to operate at pressures greater than 125 psig, even though plastic piping should not be used where liquid hydrocarbons are present.
7. Operating pressures greater than 100 psig were not required in other parts of 49 CFR Part 192 and should have been considered as a separate regulatory subject and not hidden in the gathering line definition issue.

**Misestimated Benefits in Regulator Analysis**

The PHMSA (OPS) regulatory analysis on gas gathering pipelines included the following statements and my comments are in parenthesis:

1. The total amount of gas gathering pipelines in the U.S. is estimated to be 215,000 miles. (This erroneously assumes that 215,000 miles of gas pipelines are properly defined as gathering. Wrong!)
2. Approximately 7% of the total or 16,000 miles are currently subject to safety regulation. (Regulated gas gathering lines are not subject to all the rules of transmission lines. Many of these regulated gas gathering lines in populated areas are likely to be transmission lines.)
3. Under the proposed regulatory change, some mileage currently subject to regulation would no longer be regulated. (This statement implies that PHMSA plans to reduce their already inadequate regulations on “gas gathering” lines in populated areas. There are no legislative mandates for such action.)
4. Some gas gathering mileage now not regulated that which is not “non-rural” under the current regulations, but which is located near concentrations of people meeting criteria in the proposed rule, would come under the regulations. (PHMSA is admitting an error in the prior regulations.)
5. PHMSA (OPS) estimates the proposed changes would not change the 16,000 miles of regulated pipelines.
6. PHMSA (OPS) assumes that about 4,000 miles of gas gathering lines in populated areas operate above 20% SMYS. (This is the 49 CFR Part 192 definition of a transmission line. Assumptions are not appropriate under Executive Order 12866.)
7. PHMSA (OPS) assumes that about 12,000 miles of pipelines in populated areas operate below 20% SMYS.
8. PHMSA (OPS) acknowledges that these mileage figures are essentially estimates. (No assumptions or guesses.)
9. These estimates are used throughout this analysis.
10. Determining the actual number of gathering lines that would be regulated requires the application of the criteria to each gathering (or trunk) line and its location environment. PHMSA does not have information about the location and environment of gathering lines that would allow explicit determination of whether any portion of any gathering line was in fact a transmission line.
11. Gas gathering lines subject to regulation are based on the possibility of public safety consequences from an incident. (Issue of many miles of trunklines being classified by pipeline operators as gathering was not addressed by PHMSA.)
12. Currently, PHMSA (OPS) does not have data to indicate the total number of incidents that have occurred on gas gathering lines. (Gas Pipeline Safety Act of 1968 required such data.)
13. OPS does not have this data, because most gathering lines (trunklines?) are not regulated and thus do not report incidents or other data to PHMSA (OPS). (This is an excuse for PHMSA’s failure to gather information beginning in the early 1970s.)
14. Gas Processors Association (GPA) conducted a survey of its members plus two non-member companies concerning incidents that occurred during the period 1999 to 2003. The survey covered more than 171,000 miles of non-regulated gas gathering pipelines. (GPA is an organization that primarily represents the interests of natural gas processing plants and natural gas producers, not pipelines. In the past, PHMSA has primarily worked with the American Gas Association and Gas Pipeline Research Institute on pipeline matters. The data from the GPA likely represents gathering and transmission lines upstream of gas plants. However, many of these are 20 to 100 miles upstream of gas plants. Most gas plants serve numerous gas producing fields.)
15. The GPA survey identified 58 incidents on non-regulated gas gathering (and trunk) lines during a five-year period (1999-2003). These incidents involved one fatality, three injuries and seven with property damage exceeding $25,000 each.
16. During 1999-2003, 20 incidents were reported on regulated gas gathering pipelines (0.25 incidents per year per 1,000 miles). No fatalities and two injuries occurred.
17. The GPA survey identified the predominate cause of incidents as corrosion (30) and third-party damage (15).
18. The proposed rule would focus on those parts of gathering lines where concentrations of people live.
19. For purposes of this analysis, PHMSA (OPS) assumes that incidents would continue to happen, absent new regulatory requirements.
20. A life is valued at $3.1 million.
21. A serious injury is valued at $517,150.
22. The value of life and serious injury are standard assumptions used by the U.S. DOT for the year 2003.
23. PHMSA indicated the new rule (as enacted by Amendment 192-102 in 2006) will provide regulatory relief to gas gathering line operators based on the actual risks related to the transportation of natural gas from production wells to locations where natural gas is processed for end use or enters other pipelines transporting it to end users. (The final rule did not comply with this statement. Gathering lines are those pipelines from gas wells to the point in which the well fluids are first processed or the liquid components are separated from the liquid components. This occurs near the gas wells in a field and does not require a gas plant for complex processing.)

**2016 Notice of Proposed Rulemaking (NPRM)**

On April 8, 2016, the U.S. DOT issued a notice of proposed rulemaking on “Pipeline Safety: Safety of Gas Transmission and Gathering Pipelines”. This notice was a follow up to an advanced notice of proposed rulemaking issued on August 25, 2011 on the needs for revisions and additions to 49 CFR Parts 191 and 192, especially in the area of integrity management. One of the areas of proposed rulemaking was regulation of gas gathering pipelines.

In the area of gas gathering regulation, the NPRM executive summary contained the following information:

1. The proposed rulemaking would repeal the use of API RP80 for determining onshore gathering lines.
2. A new definition is proposed for “onshore production facility/operation”.
3. The definition of “gathering pipeline” is also proposed.
4. The proposed rulemaking would extend certain 49 CFR Part 192 requirements to Type A lines in Class 1 locations for lines 8 inches and greater.
5. Requirements for regulated gas gathering lines would be limited to the previous requirements for regulated pipelines including:
	1. Damage prevention,
	2. Corrosion control,
	3. Public education,
	4. Maximum allowable operating pressure,
	5. Line markers, and
	6. Emergency planning.
6. The following requirements in 49 CFR Part 192 will not apply to gas gathering pipelines:
	1. Personnel qualification,
	2. Patrolling,
	3. Continuing surveillance,
	4. Investigation of failures,
	5. Odorization,
	6. Leak surveys,
	7. Repair of hazardous leaks,
	8. Class location surveys,
	9. Control room management,
	10. Record keeping,
	11. Field repairs,
	12. Abandonment of facilities,
	13. Reactivation of facilities, and
	14. Prevention of accidental ignition.

**Scope of Onshore Gathering Lines**

Information on the scope of gas gathering line operations included:

1. There were at least 215,000 miles of onshore gathering lines in the U.S.A. operated by over 2,800 operators.
2. There was 15,700 miles of regulated gas gathering lines reported in annual reports to PHMSA by 400 gathering operators.
3. Gas gathering mileage was provided by the Gas Processors Association (GPA) and other gas organizations. (PHMSA did not include their own records from annual reports submitted to them since the early 1970s. Why?)

PHMSA used Gas Processors Association (GPA) data for five years including 1999 through 2003 on non-regulated gas gathering lines. The GPA incident data on non-regulated gas lines was:

1. Fifty-eight (58) incidents over a 5-year period.
2. One fatality, three injuries, and seven incidents of property damage over $25,000.
3. One hundred seventy-one thousand (171,000) miles of non-regulated lines were included.
4. Average rate of incident occurrence for gathering lines was 0.073 incidents per 1,000 miles per year.

PHMSA indicated the incident rate for gas transmission pipelines during the same period was 0.27 incidents per 1,000 miles per year. During this same period, 20 incidents were reported to PHMSA on regulated gas gathering lines for an average incident rate of 0.25 incidents per 1,000 miles per year. There was no second source to validate the GPA data, because the U.S. DOT has failed to gather incident, mileage, and other safety-related data on gathering lines although required to do so since 1968 in the Gas Pipeline Safety Act of 1968.

**American Gas Association (AGA) Sources of Incident Data**

AGA has analyzed reportable incident and pipeline data for many years. AGA NG-18 Report No. 158 included the following data on gathering lines for 1970 through June 1984.

AGA Report No. 158 Data

 Miles of Pipelines

|  |  |  |
| --- | --- | --- |
| Year | Gathering | Transmission |
| 1970 | 32,383 | 251,813 |
| 1971 | 26,152 | 259,330 |
| 1972 | 23,918 | 261,657 |
| 1973 | 20,897 | 264,344 |
| 1974 | 22,858 | 271,027 |
| 1975 | 19,537 | 247,542 |
| 1976 | 22,955 | 254,600 |
| 1977 | 24,678 | 258,695 |
| 1978 | 20,371 | 282,984 |
| 1979 | 24,412 | 286,686 |
| 1980 | 34,426 | 354,431 |
| 1981 | 48,756 | 351,487 |
| 1982 | 37,201 | 305,444 |
| 1983 | 49,136 | 297,219 |

The above data, along with other data from U.S. DOT annual reports includes numerous data irregularities indicating the U.S. DOT did not rigorously analyze this data and correct any pipeline facility reporting irregularities.

For the fifteen-year period of 1970 through 1984, 184 incident reports were made on gas gathering lines. The average incident rate was about 0.5 incidents per 1,000 miles per year. The same incident rate for transmission systems was about 1.25 incidents per 1,000 miles per year. The report had a breakdown on total gas pipeline failures based on type of pipeline facility where the incident occurred. Unfortunately, there was no breakdown on pipe failures or incidents of gathering versus transmission.

AGA Report NG-18 Report No. 200 contained the following information on onshore gas pipelines for June 1984 through 1990. This was a period before the high volume production operations due to gas in shale deposits and fracking when gathering lines were small, low pressure, short, and limited to gas field locations.

AGA Report No. 200 Data

 Miles of Onshore Pipelines

|  |  |  |
| --- | --- | --- |
| Year | Gathering | Transmission |
| 1984 | 32,989 | 282,852 |
| 1985 | 34,671 | 289,755 |
| 1986 | 39,342 | 300,866 |
| 1987 | 27,359 | 262,817 |
| 1988 | 28,655 | 281,424 |
| 1989 | 29,597 | 284,154 |
| 1990 | 27,356 | 267,148 |

Report No. 200 did not break out incident data between onshore gathering lines and on transmission pipelines.

AGA report on Contract No. RP 218-9406 included the following information on regulated gathering and transmission mileage for 1985 through 1994.

AGA PR 218-9406 Data

 Miles of Onshore Pipelines

|  |  |  |
| --- | --- | --- |
| Year | Gathering | Transmission |
| 1985 | 32,431 | 281,521 |
| 1986 | 29,713 | 281,891 |
| 1987 | 29,678 | 284,235 |
| 1988 | 29,005 | 281,170 |
| 1989 | 29,597 | 284,250 |
| 1990 | 29,378 | 283,065 |
| 1991 | 28,468 | 285,512 |
| 1992 | 28,393 | 281,730 |
| 1993 | 27,767 | 290,480 |

AGA PR 218-9406 did not break out incident data between onshore gathering lines and transmission lines.

The above data from AGA reports were based on analysis of data submitted to the U.S. DOT since 1970. Why didn’t PHMSA rely on data from sources other than their own? Data from industry organizations are usually based on limited participation of member companies. These sources of data will always be understated.

The truth of the matter is that PHMSA never attempted to analyze the data submitted to them in incident and annual reports. PHMSA lazily allowed the regulated industry to analyze the causes and effects of their operating data. This included how to do the analyses and what data summaries and conclusions to include in reports.

**Bibliography**

American Gas Association Report No. 158, “An Analysis of Reportable Incidents for Natural

 Gas Transmission and Gathering Lines: 1970 through June 1984”.

American Gas Association Report No. 200, “An Analysis of Reportable Incidents for Natural

 Gas Transmission and Gathering Lines: June 1984 through 1990”.

American Gas Association Report No. 213, “An Analysis of Reportable Incidents for Natural

 Gas Transmission and Gathering Pipelines: June 1984 through 1992”.

American Petroleum Institute RP 80, “Guidelines for the Definition of Onshore Gas Gathering

 Lines”, 2000 and 2012.

American Society of Mechanical Engineers B31.8, “Gas Transportation and Distribution Piping

 Systems”, 2003, 2007 and 2012.

Federal Executive Order 12866, “Regulatory Planning and Review, 1993-2013”, Office of

 Management and Budget Circular No. A-119, February 1998.

Gideon, Kiefner and South of Battelle, “Unnumbered AGA Report” on gas transmission and

 gathering pipelines during 1970-1973”.

Pipeline Safety Act of 1992, October 24, 1992.

PRC Report PR-218-9406, “Analysis of DOT Reportable Incidents for Gas Transmission and

 Gathering Pipelines, January 1, 1985 through December 31, 1994”.

Title 49 CFR Part 192, “Transportation of Natural and Other Gases by Pipeline: Minimum

 Federal Safety Standards”, 1970-2015.

United States Department of Transportation “Draft Regulatory Evaluation on Regulated Natural

 Gas Gathering Lines”, Docket RSPA-1998-4868, 2003.

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