DEPARTMENT OF TRANSPORTATION

Research and Special Programs Administration

49 CFR Parts 192 and 195

[Docket No. RSPA–99–6355; Notice 1]

Pipeline Safety: Enhanced Safety and Environmental Protection for Gas Transmission and Hazardous Liquid Pipelines in High Consequence Areas

AGENCY: Research and Special Programs Administration (RSPA), DOT.

ACTION: Notice of public meeting and request for comments.

SUMMARY: This notice announces a public meeting to consider the need for additional safety and environmental regulations for gas transmission lines and hazardous liquid pipelines in high-density population areas, waters where a substantial likelihood of commercial navigation exists, and areas unusually sensitive to environmental damage. RSPA's Office of Pipeline Safety (OPS) intends to incorporate a process into its regulations to validate pipe integrity in these high consequence areas. The purpose of the meeting is to determine the extent to which operators now have integrity management programs, to explore effective ways to promote their development and implementation by all operators, and to discuss mechanisms by which OPS could confirm the existence and adequacy of such operator-developed programs. The meeting will discuss a practical definition of high consequence areas, as well as the need, if any, for increased inspection, enhanced damage prevention, improved emergency response, and other measures to prevent and mitigate pipeline leaks and ruptures in these areas.

DATES: The public meeting will be on November 18, 1999, from 9 a.m. to 4 p.m., through November 19, 1999, from 9 a.m. to 12 noon, at the Hyatt Dulles Hotel, 23 Dulles Corner Boulevard, Herndon, VA 20171, (703) 713–1234. If you want to make an oral presentation at the meeting, please notify Jenny Donohue no later than November 12, 1999, by phone (202-366-4046) or by Internet e-mail (donohuej@rspa.dot.gov). In addition, no later than December 20, 1999, you may submit written comments as described in the **ADDRESSES** section.

ADDRESSES: Submit written comments by mail or delivery to the Dockets Facility, U.S. Department of Transportation, Room PL-401, 400 Seventh Street, SW, Washington, DC 20590-0001. You also may submit written comments to the docket electronically. To do so, log on to the following Internet Web address: http://dms.dot.gov. Click on "Help & Information" for instructions on how to file a document electronically. All written comments should identify the docket and notice numbers stated in the heading of this notice. Anyone desiring confirmation of mailed comments must include a self-addressed stamped postcard.

The Dockets Facility is located on the plaza level, Room PL-401, of the US Department of Transportation, 400 7th St., SW, Washington, DC. It is open from 10 a.m. to 5 p.m., Monday through Friday, except federal holidays.

FOR FURTHER INFORMATION CONTACT: Beth Callsen (tel: 202-366-4572; E-mail: beth.callsen@rspa.dot.gov). You can read comments and other material in the docket on the Internet at: http://dms.dot.gov.

SUPPLEMENTARY INFORMATION:

Background

Office of Pipeline Safety (OPS) and National Transportation Safety Board (NTSB) investigations and analyses of major pipeline incidents have underscored the importance of ensuring safety and environmental protection in areas of high population density and in areas unusually sensitive to environmental damage. Congress has also directed OPS to undertake a variety of activities concerning areas where the risk of a pipeline spill could have significant impact (what we call high consequence areas). For example, Congress directed OPS to prescribe, if necessary, additional standards requiring the periodic inspection of each pipeline in high population density areas or in areas unusually sensitive to environmental damage (49 U.S.C. 60108 (b)).

In response to the Congressional directive, OPS created the Risk Management Demonstration Program, the Systems Integrity Inspection (SII) Program, and other initiatives. These programs encourage and evaluate operator-developed safety and environmental management processes that incorporate operator- and pipeline-specific information and data to identify, assess, and address pipeline risks. These programs, along with the Oil Spill Response Plan Review and Exercise Program, have helped OPS refine regulatory oversight processes. These processes help to ensure that pipeline operators have effective processes in place to identify the most important risks to the public and the environment, and to develop and implement cost-effective preventive and mitigative actions to manage these risks. Many of these initiatives have validated the importance of focusing resources and establishing higher levels of protection in areas where a pipeline spill could have significant consequences.

Through its various programs and initiatives, OPS has observed and become familiar with the wide array of existing operator safety programs that identify, assess, and address all significant risks to the pipeline in an integrated manner. These operator-developed programs closely examine internal inspection data, surveillance and operating information such as expected population growth, land use, and construction activity along the pipeline, and other information relevant to assuring the pipeline's integrity in high population areas and in environmentally sensitive areas. OPS believes the next step is to determine the extent to which such programs exist, to develop effective ways to encourage their development and implementation by all operators, and to establish mechanisms by which OPS can confirm the existence and adequacy of such operator-developed programs.

OPS believes that current pipeline safety regulations address the most important risks to the nation's pipelines, and have served the industry well, resulting in a good safety record compared to competitive modes of transportation. However, safety programs based on strict compliance with the regulations can often result in a piece-meal approach to identifying and controlling risks, sometimes neglecting the interrelationships among failure causes and the benefits of coordinated risk control activities.

OPS is considering ways to further enhance safety and environmental protection in areas where a pipeline failure could have serious consequences for the public or the environment, i.e., high consequence areas, through a more integrated approach to identifying and addressing risks. A conceptual approach is described below. OPS believes that many operators already have processes in place that are consistent with this approach. Through this Notice and the November 18-19, 1999, public meeting, OPS is soliciting input on this or other approaches to improved protection for high consequence areas.

Key Elements

OPS envisions a process that places stronger regulator and operator emphasis on high consequence areas in the vicinity of pipeline facilities. The following key elements should be reflected in such a process:

1. The need for pipeline-specific assessments in determining the need for additional preventive and mitigative activities.

OPS recognizes that industry-wide requirements for specific additional preventive or mitigative actions might not be the most effective way of reducing risk. Companies must have the responsibility and the necessary flexibility to consider geographic- and segment-specific conditions in assessing the need for additional safety and

environmental protection programs and in developing effective programs.

2. The need to assess all risk factors and risk reduction activities in an integrated manner.

Analyses of major pipeline incidents show that combinations of design, operation, maintenance, and environmental factors are usually involved, rather than a single cause. Accordingly, OPS envisions assessment and decision processes that examine causes for pipeline failure in a comprehensive and integrated manner. For example, data from internal in-line inspections must be combined with other information related to the condition of the pipe (e.g., results of close internal surveys and patrols) to determine appropriate evaluation and remediation activities.

3. The need for increased assurance that high consequence areas are being protected.

OPS recognizes that existing regulations and industry practices already focus on some high consequence areas. For example, the class location scheme embedded in the gas pipeline regulations imposes more stringent requirements in areas with higher population. Many liquid pipeline operators already have formalized environmental, safety, and health programs that focus attention and resources on areas of highest risk. However, OPS also recognizes the need to assure the public that the condition of the pipelines in high consequence areas is adequately known, that current regulations and industry practices are adequate, and that the need for additional protection has been explicitly and responsibly considered.

OPS's Approach to Improved Protection

OPS envisions a process that would include, at the least, the following steps:

- Defining and Locating High Consequence Areas
- Identifying Affected Pipeline Segments
- Inspecting and Assessing the Condition of the Affected Segments
- Assessing the Need for Additional Preventive or Mitigative Actions
- Remediating and Repairing the Affected Segments as Necessary
- Implementing and Monitoring Other Cost-Effective Risk Control Activities
- Documenting Inspections, Assessments, and Actions
- Reviewing and Ensuring Compliance

(See the Flowchart included in this Notice.)

Each of these steps is briefly discussed below, including key questions for discussion.

• Identifying and Locating High Consequence Areas

The first step in the process is to identify and locate the areas where a pipeline failure could pose serious safety and environmental consequences to the public or environment. This first step is intended as a filtering step, focusing attention on those areas of possible high consequence. Subsequent steps address the likelihood of such consequences actually occurring, and the need for any action to reduce the likelihood or consequences of a pipeline incident in these areas.

There are relevant past and current efforts to define or identify these areas.

- Class locations for gas pipelines (49 CFR 192.5) are based on habitable structures within a 220 yard corridor on either side of the pipeline.
- Many companies have developed Geographic Information Systems (GIS) that can provide accurate, more detailed information concerning the proximity of population and buildings to the pipeline.
- OPS, other federal agencies, and the hazardous liquid pipeline industry are working together to develop a definition for Unusually Environmentally Sensitive Areas (USAs), focusing on areas in which a pipeline spill could threaten local water supplies, threatened and endangered species, and other environmental resources (Docket No. RSPA-99-5455; 64 FR 38173; July 15,1999). OPS is currently pilot testing a model for defining USAs.

In high consequence areas, OPS believes that an operator should be required to explicitly assess each area, determine the condition of the pipeline that could affect these areas, understand the potential causes of failure of these pipelines, and ascertain the need, through a structured and documented process, for additional preventive or mitigative actions.

Key questions that OPS would like to discuss at the meeting include:

a. How should "high consequence" areas be defined?

1. What is the status of OPS's definition of USAs?

2. What should be the definition of "high population density" area for a natural gas pipeline?

3. Can operator GIS systems be used to identify high population areas with greater precision than current class location schemes?

4. What should be the definition of "high population density" area for a hazardous liquid pipeline?

5. Should "high property damage," "significant disruption in service," "significant disruption in commerce," "waters where a substantial likelihood of commercial navigation exists," or the potential for other significant consequences be included in the definition of high consequence areas?

b. Should the operator or OPS be responsible for identifying the location of high consequence areas?

c. What percentage of na tural gas pipelines might be expected to intersect high consequence areas (e.g., what percentage currently are in Class 3 or Class 4 locations?)

d. What percentage of hazardous liquid pipelines might be expected to intersect high consequence areas (e.g., what percentage currently are in non-rural areas or intersect USAs).

e. What process should OPS or the industry use to ensure that the identified high consequence areas continue to reflect current conditions along the pipeline (e.g., population expansion, new information on environmental resources) ?

2. Identifying Affected Pipeline Segments

In this step, the specific pipeline segments whose failure could have serious safety or environmental consequences are identified. Once the high consequence areas are located on a map, the existing pipelines must be overlaid to identify the segments in or in close proximity to these areas. The physical ability of the overlaid pipeline segments to affect the environmental resources in the area or to impact the surrounding population must then be examined. The fact that a pipeline is within a high consequence area (defined in the first step) does not necessarily mean that a pipeline leak or rupture can result in environmental damage or impact public safety. For example, the population in a "high population density" area might be physically located sufficiently far from the pipeline to preclude safety impact. There may also be topographical barriers between the environmental resource and the pipeline that would preclude migration of any spill from the pipeline to the resource. This step, in conjunction with the first screening step, allows the pipeline operator to take into account pipeline-specific information to identify those segments of pipe that could result in environmental damage or public safety consequences.

Key questions that OPS would like to discuss at the meeting include:

- Does adequate data exist for operators to reliably ascertain the specific pipeline segments that could affect "high consequence" areas?
- Should pipeline segments near, but not within, high consequence areas also be examined for possible impact? If yes, what kinds of assumptions should be used to determine whether or not an impact occurs (e.g., use of "worst case discharge" from spill response plans)?
- What would be the expected cost to an operator to perform this step?

3. Inspecting and Assessing the Condition of the Affected Segments

The next step in the process is for the operator to understand and assess the condition of the pipeline segments identified in Step 2. This step, in conjunction with the following step, is intended to ensure that the likelihood of pipeline failure due to internal or external corrosion, construction damage, previous excavation damage, or other mechanical damage is very low.

Undetected defects introduced by corrosion or by outside force damage have caused major pipeline accidents. Some of the major pipeline incidents over the last decade involved degradation of wall thickness from dents or gouges caused by outside force or third party damage. In some instances these dents and gouges had been in the pipe for a period of time before failure, and the line had not been inspected using internal inspection tools capable of detecting wall thinning or geometric defects in the pipe. OPS is especially interested in methods to detect and repair such defects before they lead to leaks or ruptures in high consequence areas.

One acceptable way of performing this step would be the use of an intelligent in-line inspection device (smart pig) appropriate to the type of pipeline being inspected. An operator can also use alternative, equivalent means to assess the condition of the affected segments. If the line has recently been pigged, the operator could review the available pig data in conjunction with other current data (e.g., from close interval surveys) to assess the condition of the line. This step results in an operator identifying anomalies (areas of potential loss of wall thickness or pipe damage) that should be investigated further.

The hazardous liquid pipeline industry has developed recommended practices for monitoring, testing, and inspection methods that go beyond the requirements of 49 CFR part 195 (API Recommended Practices 1129, Assurance of Hazardous Liquid Pipeline System Integrity). This document comprises a range of best practices—including design and construction; monitoring and controls; inspections, reviews and audits; and damage prevention-to assist pipeline operators in improving the integrity of their pipeline systems.

Key questions that OPS would like to discuss at the meeting include:

- Are current industry standards sufficient for pipelines in high consequence areas? For example, is the ASME B.31 standard, used by operators to determine acceptable pipe wall loss, appropriate in high consequence areas? Or should more conservative standards apply in these areas?
- What is the current capability of smart pigs to find prior mechanical damage and other defects?
- What alternatives to internal inspection can provide equivalent information on pipeline condition?
- How recently should a line have been pigged to provide reliable data for this step? What factors should be considered in making this determination (e.g., recent construction activity, cathodic protection system performance, interference from foreign line crossings, *etc.)?*
- What percentage of natural gas pipelines in Class 3 or Class 4 areas have been smart pigged in the last 5–10 years?
- What percentage of hazardous liquid pipelines intersecting non-rural or environmentally vulnerable areas might be expected to have been smart pigged in the last 5-10 years?
- What is the expected cost to an operator to pig (or equivalent) pipeline segments that would impact high consequence areas?
- How soon should the condition of the a line be assessed after determining that it could impact a high consequence area?
- What criteria should be used to identify anomalies that require further investigation?
- What is the appropriate period between pig runs for high consequence areas? (Should this period be based on pipeline-specific conditions impacting the likelihood of corrosion or mechanical damage?)
- Should OPS specify minimum performance criteria for internal inspection tools? If so, what should those criteria be?

4. Assessing the Need for Preventive or Mitigative Actions

In this step, the operator would determine the most likely causes of failure in the identified high consequence areas, and determine if any additional preventive or mitigative actions, beyond those the regulations require or the operator performs, are needed. In addition to assessing the need for repairs to lower the likelihood of leaks or ruptures due to corrosion or past mechanical damage (in Step 3), the operator should also assess the need for additional preventive actions to lower the likelihood of failure from all potential causes (e.g., third party damage, geological hazards, operation and control center malfunctions, *etc.)* or additional mitigative actions to reduce the consequences should the pipeline leak or rupture.

This assessment should be performed as part of an integrated, segment-specific assessment of the possible causes of pipeline failure, and cost-effective actions to reduce the specific risks identified on these segments.

Although internal inspection and remediation of the lines can help ensure the condition of the lines, inspection and remediation does not address many important causes of pipeline failure. For example, OPS data show that in 1998, 37 percent of reported gas pipeline incidents were due to outside force damage. Similarly, on hazardous liquid pipelines, outside forces caused 26 percent of reportable events. Additional preventive measures may be needed to reduce the likelihood of these reported incidents, or to reduce the expected level of consequences should an incident occur. Accordingly, in addition to internal inspection of pipeline segments in high consequence areas, OPS is also interested in comment on the need for additional assessments and analyses of other preventive and mitigative measures to reduce risk in these areas.

For example, additional preventive measures might include the development of enhanced damage prevention programs. Recently, OPS sponsored a multi-industry effort to define best practices in damage prevention. Although OPS is not considering translating these best practices into regulations, it is interested in comments on how to otherwise promote the adoption of damage prevention best practices to reduce the likelihood of pipeline incidents. Additional mitigative actions might include developing enhanced emergency response plans in high consequence areas, or using emergency flow restricting devices or remotely controlled valves to limit the amount of product loss following a line failure.

Key questions that OPS would like to discuss at the meeting include:

• What structured assessment and decision processes could operators use to perform this step?

• What percentage of the natural gas industry already has structured processes in place to perform such assessments?

• What percentage of the hazardous liquid industry already has structured processes in place to perform such assessments?

• What should be the criteria for deciding whether additional actions by the operator are required?

• What would be the expected cost of performing such an assessment?

5. Repairing the Affected Segments as Necessary

In this step, the operator would determine which anomalies require remediation, and the appropriate means of repair. This step, in conjunction with the previous step, is intended to ensure that the likelihood of pipeline failure due to internal or external corrosion, construction damage, previous excavation damage, or other mechanical damage is very low.

Key questions that OPS would like to discuss at the meeting include:

• Should current industry standards (e.g., ASME B.31G) be used as the repair criteria, or do other methodologies exist or need to be developed for pipelines in high consequence areas?

• What is the status of the current rulemaking to allow alternative repair techniques?

• After an operator identifies anomalies requiring repair, how much time should be allowed in which to complete the repair work?

• What would be the expected additional cost to the operators of more stringent inspection and repair criteria?

6. Implementing and Monitoring Other Cost-Effective Risk Control Activities

The operator would then be expected to implement the additional preventive and mitigative actions, and monitor their effectiveness over time to ensure that they are producing the risk reductions envisioned. The operator would be expected to implement the activities in a timely manner, consistent and integrated with internal budget processes that establish priorities and allocate resources based on risk significance of the planned activities.

Key questions that OPS would like to discuss at the meeting include:

• How can operators monitor the effectiveness of risk control activities?

• How would integrating an implementation schedule into normal operator maintenance schedules or budget cycles affect the cost of implementing these activities?

7. Documenting Inspections, Assessments, and Actions

An operator would maintain records establishing compliance with any new requirements addressing high consequence areas, including records identifying pipe segments capable of affecting high consequence areas, the schedule of inspections, the findings of the inspections and assessments, and the preventive and mitigative actions taken.

A key question that OPS would like to discuss at the meeting:

• What would be the expected costs and labor burdens of these documentation requirements?

8. OPS Reviews Operator Compliance

OPS will examine the operator's records to ensure compliance. OPS currently envisions an on-site review of the company's program documentation and records, as well as interviews with key management personnel responsible for implementing the process. The specific review activities will be tailored for the company's management system and assessment processes. Major review activities are expected to include:

• Reviewing the policies, procedures, guidelines, and manuals that describe how the company identifies the pipeline segments that could impact high consequence areas and assesses the need for additional protection on these segments.

• Reviewing the company's assessment and decision making processes.

• Reviewing in-line inspection data and the criteria to determine if further evaluation and repair is required.

• Reviewing the status of remediation and other preventive or mitigation actions.

• Reviewing performance measures to understand, evaluate, and demonstrate the effectiveness of the company's decisions.

• Meeting with company management to understand the level of management support and awareness of the program to protect high consequence areas.

After the review of the operator's internal processes and documentation, OPS will conduct field validation checks. These validation checks will confirm that the operator has implemented the additional preventive and mitigative activities.

The selection of field inspection sites will consider the operator's assessment and results. Where possible, the OPS team will perform an integrated review of information from a variety of sources (e.g., internal inspection results, close interval surveys, leak history, and other observed conditions) in selecting field validation check sites.

After the OPS inspection team has completed its review and field validation checks, the team will prepare a summary report. This summary report will contain observations on the operator's program and processes, as well as on the effectiveness of this program in enhancing protection for high consequence areas. The report will document the positive features of the company's program and any areas that need improvement. The report will include any process improvements that OPS has determined are necessary, and the operator's work plan for addressing them. If compliance issues are discovered during the review, OPS will determine the appropriate resolution of these issues through its normal enforcement processes, and the resolution of those issues will be included in this report.

Key questions that OPS would like to discuss at the meeting include:

• How can OPS ensure consistency of review across all companies?

• What review protocols or criteria will OPS use to evaluate the effectiveness of an operator's assessment and decision-making processes?

• What is the appropriate avenue for public input into the decision-making process to protect high consequence areas?

• What qualifications or training should OPS inspectors have to perform this verification?

Information Requested

Consistent with the President's regulatory policy (E.O. 12866). OPS wants to carry out the mandate to consider additional inspections, and other preventive and mitigative measures at the least cost to society. Toward this end, interested persons are urged to present views on whether additional inspection requirements or other preventive and mitigative actions are needed to ensure adequate protection of high consequence areas. The questions listed above provide more specific guidance on the information being solicited for each step in the process. In addition, and applicable to all steps in the envisioned process, OPS is also interested in comments on the expected cumulative costs and benefits associated with implementing the described process, any comment on whether any of these measures would have a disproportionate impact on small operators, and any concerns on the information collection, recordkeeping, or reporting requirements of any of these initiatives under the Paperwork

Reduction Act of 1995 (44 U.S.C. 3057 (d)) .

Authority: 49 U.S.C. Chapter 601 and 49 CFR 1.53.

Issued in Washington, DC on October 14, 1999.

Richard B. Felder,

Associate Administrator for Pipeline Safety.

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Enhancing Safety and Environmental Protection in High Consequence Areas

Define Which Pipelines Could Impact High Consequence Areas

1. Identify High Consequence Areas

A. High Population Density Areas
B. Unusually Sensitive Environmental Areas
C. Commercial Navigable Waterways

2. Identify Affected Pipeline Segments

A. Locate High Consequence Areas
B. Identify Pipeline Segments Capable of Impact

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Determine Threats to the Pipelines in these Areas

3. Assess Current Condition of the Affected Segments

A. Internal Inspection or Equivalent (or re-examines pig data)
B. Examine Other Relevant Data (e.g., CIS, construction activity over pipeline)
C. Evaluate Inspection and Other Data
D. Identify Anomalies Requiring Repair or Further Investigation

4. Identify the Most Likely Failure Causes of the Segments

A. Operator Uses Structured Processes to Identify the Most Likely Causes of Failure of the Affected Segments

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Identify and Implement Actions to Improve Protection

5. Remediate Affected Segments as Required

A. Compare Results of Investigators to Repair Criteria
B. Make Necessary Repairs

6. Address Segment Risks as Necessary

A. Assesses Impact and Cost of Additional Activities to Prevent or Mitigate Failures of Affected Segments
B. Identify Cost-Effective Activities to Reduce Risks on Affected Segment
C. Operator Implements Additional Activities

Monitor Implementation and Results

7. Document Assessment and Actions

A. Operator Documents Results of Evaluations and Actions Taken

B. Operator Monitors Implementation and Impact of Actions

- **Inspection and Enforcement**

A. OPS performs program audit and field inspection for interstate pipelines

B. Participating state agencies perform audit and field inspection for intrastate pipeline

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