WELCOME

We are delighted that you have come to this Office of Pipeline Safety public meeting in New Orleans to learn more about the five Pipeline Risk Management Demonstration Program building blocks: the program framework, the program standard, the performance measures guidance, the communications plan, and the training outline.

We hope that you will ask questions and respond to the presentations on the building blocks and the prototypes, which are designed to enhance your understanding of how the demonstration projects will work. This public meeting is also intended to demonstrate how OPS and State pipeline offices will oversee operators conducting demonstration projects which is a different approach than currently used to oversee operators complying with the existing regulations.

Thank you for taking the time to participate in planning the approach to test risk management in the pipeline industry.
AGENDA

8:00 AM   Welcome and Introduction    Rich Felder, OPS
8:10 AM   RSPA Perspectives          Kelley Coyner, RSPA
8:20 AM   Risk Management Building Blocks Panel    Rich Felder, Moderator
          Program Framework
          Program Standard
          Performance Measures Guidance
          Communications Plan
          Training Outline
          Stacey Gerard, OPS
          Denise Hamshler, Lakehead Pipe Line
          Ivan Huntoon, OPS
          Don Stursma, Iowa Commerce Department
          Stacey Gerard, OPS
          Richard Sanders, Transportation Safety Institute

10:00 AM  Break
10:20 AM  Audience Questions and Comments
11:30 AM  Lunch

1:30 PM   Prototypes                   Moderator:
          Mike Neuhard
          Fairfax County Fire Department
          Participants:
          Bruce Hansen, OPS
          Andy Drake, Pan Energy
          Beth Callsen, OPS
          Gary Zimmerman, Shell Pipeline

2:30 PM   Audience Questions and Comments
3:15 PM   Break
3:35 PM   Summary                     Joe Martinelli, Petroleum Industry Sponsor
          API General Committee on Pipelines
          John Riordan, Gas Industry Sponsor
          INGAA Pipeline Safety Task Force

3:55 PM   Closing                     Rich Felder, OPS
5:30 PM   State Business Meeting
MEMORANDUM FOR THE SECRETARY OF TRANSPORTATION

SUBJECT: Accountable Pipeline Safety and Partnership Act of 1996

Today, I am signing into law the Accountable Pipeline Safety and Partnership Act of 1996. This bipartisan bill will improve pipeline safety and provide the Department of Transportation with the flexibility to develop innovative approaches to pipeline safety regulation.

This law advances my Administration's program to strengthen protection of human health, public safety, and the environment. This law also furthers our goal of working with companies that have exemplary records to provide greater regulatory flexibility, while requiring accountability to ensure that public safety and the environment are protected. By this memorandum, I am directing the Secretary of Transportation to implement administrative safeguards for carrying out the law that will enhance accountability and protection of public safety and the environment.

1. **Protection of Public Safety and the Environment.** In setting forth certain risk management reforms in this Act, the Congress recognized that the Department's Office of Pipeline Safety (OPS) already has in place a risk assessment prioritization program, a peer review process, and other reforms that meet the language of the Act in nearly all respects. The Secretary shall ensure that any further changes to the regulatory process mandated by the Act are undertaken in a way that precludes additional delay or unnecessary analysis, and ensures a balanced peer review process.

Similarly, as intended by the Congress in the provisions for cost-benefit analysis provided in the legislation, I direct the Department to continue to give full consideration to the benefits of public safety and environmental protection, whether or not those benefits have been quantified, in determining whether the benefits justify the costs of proposed regulations. When setting standards, the Secretary shall also consider the need to provide an adequate margin of safety, particularly in areas of uncertainty.
3. **Unusually Sensitive Areas.** Under the Pipeline Safety Act of 1992, the Department is engaged in a regulatory process to determine areas that may be unusually sensitive to environmental damage if there is a hazardous liquid pipeline accident, and thereby define areas where pipelines will be subject to increased testing and inspection. In the new legislation, the Congress listed examples of areas that should be considered in this process, while emphasizing that the bill language is "not exclusive" and that the final description is committed to the Secretary’s discretion. The Secretary is directed to consult closely with the Administrator of the Environmental Protection Agency in finalizing this description to ensure consistency with the Administration’s environmental policies.

More specifically, I am directing the Secretary to accord full protection to all wetlands and other aquatic areas, all of which serve vital ecological functions. Moreover, the Department should consider potential injuries to natural resources or the environment that are short-term or not permanent in nature, as well as the potential for permanent or long-term injuries. The Department should ensure that all wetlands and other environments are fully considered in defining unusually sensitive environmental areas.

4. **Report By the Secretary.** Upon submission of the Report to Congress required by this legislation, the Secretary shall present a report to the President establishing satisfactory fulfillment of the terms of this memorandum. This memorandum shall include appropriate recommendations, developed in consultation with other interested agencies, for enhancing environmental protection and public safety in future legislation for reauthorization of the pipeline safety program.

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William J. Clinton
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Excerpts from the Accountable Pipeline Safety and Partnership Act of 1996
(Public Law 104-304, October 12, 1996)

49 U.S.C.
SUBTITLE VIII- PIPELINES

Chapter 601 - SAFETY

Sec.
601. Definitions. 60101
602. General authority. 60102
603. Standards for liquefied natural gas pipelines facilities. 60103
604. Requirements and limitations. 60104
605. State pipeline safety program certifications. 60105
606. State pipeline safety agreements. 60106
607. State pipeline safety grants. 60107
608. Inspections and maintenance. 60108
609. High-density population areas and environmentally sensitive areas. 60109
610. Excess flow valves. 60110
611. Financial responsibility for liquefied natural gas facilities. 60111
612. Pipeline facilities hazardous to life and property. 60112
613. Customer-owned natural gas service lines. 60113
614. One-call notification systems. 60114
615. Technical safety standard committee. 60115
616. Public education programs. 60116
617. Administrative. 60117
618. Compliance and waivers. 60118
619. Judicial reviews. 60119
620. Enforcement. 60120
621. Actions by private persons. 60121
622. Civil penalties. 60122
623. Criminal penalties. 60123
624. Biennial reports. 60124
625. Authorization of appropriations. 60125

60126. Risk management.
60127. Population encroachment.
60128. Dumping within pipeline rights-of-way.

October 12, 1996
the application of risk assessment and risk management methodologies that are suitable to the inherent risks that are determined to exist through the use of models developed under subparagraph (E);

(G) the development of project elements that are necessary to ensure that-

(i) the owners and operators that participate in the demonstration project demonstrate that they are effectively managing the risks referred to in subparagraph (E); and

(ii) the risk management plans carried out under the demonstration project under the subsection can be audited;

(H) a process whereby an owner or operator of a pipeline facility is able to terminate a risk management plan or, with the approval of the Secretary, to amend, modify, or otherwise adjust a risk management plan referred to in paragraph (1) that has been approved by the Secretary pursuant to that paragraph to respond to-

(i) changed circumstances; or

(ii) a determination by the Secretary that the owner or operator is not achieving an overall level of safety that is at least equivalent to the level that would otherwise be achieved through compliance with the standards contained in this chapter or promulgated by the Secretary under this chapter;

(I) such other elements as the Secretary, with the agreement of the owners and operators that participate in the demonstration project under this section, determines to further the purposes of this section; and

(J) an opportunity for public comment in the approval process; and

(c) EMERGENCIES AND REVOCATIONS.—Nothing in this section diminishes or modifies the Secretary’s authority under this title to act in case of an emergency. The Secretary may revoke any exemption granted under this section for substantial noncompliance with the terms and conditions of an approved risk management plan.

(d) PARTICIPATION BY STATE AUTHORITY.—In carrying out this section, the Secretary may provide for consultation by a State that has in effect a certification under section 60105. To the extent that a demonstration project comprises an intrastate natural gas pipeline or an intrastate hazardous liquid pipeline facility, the Secretary may make an agreement with the State agency to carry out the duties of the Secretary for approval and administration of the project.

October 12, 1996
Program Framework for Risk Management Demonstrations

SUMMARY: The Research and Special Programs Administration's (RSPA) Office of Pipeline Safety (OPS) is considering a program framework for its Pipeline Risk Management Demonstration Program required by the Accountable Pipeline Safety and Partnership Act of 1996. The Demonstration Program will invite pipeline operators to propose risk management projects for one or more parts of their pipeline systems that, upon approval by OPS, will substitute for the existing Federal safety standards in providing the basis for Federal oversight of pipeline safety and environmental protection. This document describes the Demonstration Program, the activities already underway to prepare for it, and the next steps in the process; describes the objectives to be achieved by the demonstration projects; provides needed guidance for pipeline operators who may wish to participate; and invites public involvement in the process through various opportunities for public comment and public meetings. A separate document, the Interim Risk Management Program Standard, provides specific direction to interested operators on developing risk management programs, including the projects in this Demonstration Program.

I. Overview

Section 5 of the Accountable Pipeline Safety and Partnership Act of 1996 (Pub.L.No.104-304, Oct. 12, 1996) requires OPS to establish the Pipeline Risk Management Demonstration Program and sets forth requirements for carrying out risk management projects. In a memorandum issued when the statute was enacted, the President directed the Secretary of Transportation to use his discretion to administer the Demonstration Program with certain safeguards in place. The safeguards identified in the President's memorandum to the Secretary include making provisions for:

- Accepting projects that can achieve superior public safety and environmental protection.
- Enabling full and meaningful participation by affected communities and constituencies in risk management project approval.
- Using orders ensuring that the requirements of risk management projects are subject to full enforcement authority.
- Limiting the number of demonstration projects to ten (10).
- Limiting participation to operators with clear and established records of compliance with respect to safety and environmental protection.

The statutory requirements, the President's memorandum to the Secretary, comments on previous framework concepts (published in 60 FR 49040, September 21, 1995, and 60 FR 65725, December 20, 1995), and other stakeholder input were used to develop the present framework, which provides guidance to operators who may decide to participate in the demonstration projects that are expected to begin in 1997.

November 15, 1996
Risk management can provide pipeline owners and operators greater flexibility in their choice of safety-related activities than is possible within OPS's present universally applicable regulatory program. Risk management enables a company to customize its safety program to address its pipeline's particular risks. Furthermore, risk management is a dynamic process, with built-in features for evaluating and improving safety activities as experience is gained.

The demonstration projects will test whether allowing operators the flexibility to allocate safety resources through risk management is an effective way to improve safety, environmental protection, and reliability. They will also provide data on how to administer risk management as a permanent feature of the Federal pipeline safety program, should risk management prove to be a viable regulatory alternative. The new standards, technologies, and communication processes developed by operators and OPS for the risk management demonstration projects will be adapted to support the range of risk-based regulatory, compliance, and research and development activities OPS presently has under development.

OPS expects that risk management methods and the formalized process of interactions and negotiation between regulators and company personnel will result in superior public safety and environmental protection than could otherwise be attained through existing regulatory requirements. Risk management is, by OPS definition, a more systematic and thorough assessment of risk and risk control options, with the intended result of superior decision making. As a result of improved assessment, OPS believes there is a potential to identify more risk than may have been found using existing practices.

OPS plans to select companies for demonstration projects with a demonstrated commitment 1) to work in partnership to evaluate merits of risk management processes and technologies and 2) to develop risk management as an integral part of company day-to-day business practices, at least related to the demonstration project. The selection criteria favors projects showing potential for more comprehensive risk management applications. All participants will be focused on improving safety and environmental results, prioritizing resources more effectively, and enhancing the ability of government and industry to effect positive outcomes. OPS will have clear profiles of its assessment of pipeline integrity before and after the demonstration program. At the program conclusion, OPS fully expects to have a better understanding of individual pipeline risks and to be in a better position to evaluate risk control options.

Finally, OPS expects risk management to be able to provide better accountability for safety and environmental protection, and a better basis to communicate with the public. To assure that safety and environmental protection improve, OPS will measure local, project-specific data such as current physical data, new test data, comparison with similar segments, outcomes from risk control actions, precursor or "anticipative" event measures, level of risk awareness, history of service interruptions and incident data. OPS also expects to measure improvements in communications, understanding, and resulting increased ability of government and industry to effect desired safety and environmental project outcomes. OPS and operators participating in the Demonstration Program will report to the public periodically during the four year period.

November 15, 1996
OPS will be accepting into the Demonstration Program those projects, as proposed or ultimately negotiated, that are expected to achieve superior public safety and environmental protection than is currently being achieved through regulatory compliance. Because of the nature of the risk management process, OPS believes that operators choosing to participate will be able to propose projects demonstrating such protection.

Each demonstration project is expected to have a four-year duration. Participation in risk management demonstrations will be voluntary and subject to OPS approval based on criteria set forth later in this notice. Eligibility for the demonstration projects beginning in 1997 is limited to interstate natural gas transmission and hazardous liquid pipeline companies. RSPA may later broaden eligibility to include distribution and other intrastate operators.

II. Activities Presently Underway and Next Steps

The December 20, 1995, Federal Register notice gave the background for OPS’s consideration of company-specific risk management projects as an alternative to the existing regulations. The notice described many of the safety, environmental, legislative, technical, public perception, and economic factors driving government, corporate, and public interest in risk management.

Since December 1995, OPS has been working with “joint risk management quality teams” (JRAQT) composed of representatives of state pipeline regulatory agencies, the oil and gas industries, and local public safety and environmental representatives to develop the five primary components of the Pipeline Risk Management Demonstration Program. These components include the Interim Risk Management Program Standard, the guidance for assessing risk management as a regulatory alternative using general industry data, the training protocols for instructing government and corporate participants about their new roles under risk management, a plan for productive communication between all participants and the public, and the regulatory framework presented in this notice. The standard and the regulatory framework are now ready for public comment. The guidance for assessing risk management as a regulatory alternative will be ready for public comment in November.

The Interim Risk Management Program Standard will serve as a common ground upon which the pipeline industry can develop and refine effective risk management demonstration projects that regulators can approve and monitor. It defines certain elements that all programs should contain, but allows flexibility to each company to customize its project to fit its particular needs and corporate practices, and allows projects to evolve as experience is gained. The standard will also provide companies guidance for selecting performance measures to ensure that safety and environmental protection are safeguarded in demonstration projects. Directions for obtaining and commenting on the standard are at the front of this notice.

The regulatory framework component presented in this notice guides pipeline companies in how they can gain OPS approval of their risk management projects and describes how OPS would monitor the plans. The framework presented here will guide the demonstration projects that

November 15, 1996
begin in 1997. The experience gained from the demonstration projects will help OPS to later develop a permanent procedure for approving risk management projects, if risk management proves to be a viable regulatory alternative. Directions for public comment on the regulatory framework are also at the front of this notice.

To help ensure that the Demonstration Program components provide the flexibility to fairly and consistently evaluate and support actual risk management projects, OPS has been conducting a series of meetings with individual operators since August 1996. The topics of discussion include risk management projects the operator has in place or under consideration and criteria OPS might use to evaluate them. During the meetings, operators also learn about and comment on the Demonstration Program components under development. Companies interested in such a meeting should see the front of this notice for contact information.

OPS has held two public meetings on risk management demonstration projects and will hold a third on Tuesday, January 28, 1997, in New Orleans, Louisiana (see the front of this notice for scheduling and lodging information). At that meeting, OPS and the JRAQT will present the Interim Risk Management Program Standard that operators will use during the demonstration projects. OPS will also present prototype risk management projects to illustrate the documentation needed and the types of issues to be addressed during project review, approval and monitoring. After the meeting, OPS will publish a Federal Register notice to begin the project approval process described in Section IV of this notice. Between now and the January meeting, OPS will continue to refine the Demonstration Program components based on public comment on this notice, meetings with individual operators, national public, environmental and other interested organizations, and continued interaction with industry and the States through the JRAQT teams.

III. Risk Management Demonstration Program Objectives and Policies

The objectives of the Pipeline Risk Management Demonstration Program, which stem from the statutory requirements and the Presidential directive, are to accomplish the following:

- To show that more effective allocation of resources can result in improved safety and environmental protection over what is presently achieved through regulatory compliance.
- To address risks not addressed by regulations by capitalizing on features inherent to the risk management process, such as improved quality and integration of safety data and, as a result, more comprehensive assessment of threats.
- To systematically test risk management as a regulatory alternative through objective evaluation under a broad range of conditions.
- To establish a common framework for productive communication with public safety officials and the public, and for getting meaningful public input into the risk management process.
- To develop and apply new risk assessment models, processes and technologies.
OPS believes that the following elements need to be structured into the Demonstration Program:

1. Operators participating in the Pipeline Risk Management Demonstration Program will need to provide sufficient data and background information to enable OPS to determine whether risk management is an effective regulatory alternative that provides superior safety and environmental protection.

Implicit in a company's participation in the Demonstration Program should be the commitment to work in partnership with OPS to determine whether and how risk management might become a permanent feature of the Federal pipeline safety program. OPS will ask for evidence that risk management, as it relates to the proposed demonstration project, is or will be developed and implemented as an integral part of the day-to-day business practices of the company. OPS will also periodically ask companies for suggested refinements to the primary program components.

In keeping with the Interim Risk Management Program Standard, the operator must identify project-specific performance measures that demonstrate the effectiveness of the risk-control decisions being made. During the project approval process, OPS will determine whether these local project-specific performance measures appear appropriate and adequate. Throughout a demonstration project, the operator will evaluate local and broader program measures and ensure that the performance measures are appropriate and adequate. The operator would periodically report on these project-specific performance measurements to OPS.

OPS is developing guidance for additional more general measures operators would report during the four-year demonstration period to enable OPS to determine the effectiveness of risk management as a regulatory alternative. These measures will help OPS answer the following questions:

- Does risk management result in a greater safety, environmental protection, and service reliability than would otherwise be achieved through compliance with the safety regulations?
- Are resources being better prioritized and more effectively applied under risk management?
- Has agency and industry involvement in the discussion of risks and risk control options, and the agency and industry's ability to impact desired outcomes, increased under risk management?

2. Operators will be allowed to reallocate resources geographically, as long as safety is adequately safeguarded at each location along a demonstration site.

OPS will allow operators the flexibility in a risk management demonstration project to reallocate safety resources across several pipeline segments. An operator may substitute
one or more activities for others, or do away with redundant activities altogether, as long
as the basic safety and environmental protection along the pipeline is safeguarded at each
point. However, it is still expected that the overall demonstration project performance
will result in superior safety and environmental protection.

(3) **OPS will consider approving demonstration projects of various scopes and complexities.**

The scope of a risk management demonstration project may be an entire pipeline system
and all safety activities, or may be focused on parts of a system and specific activities.

Since operators have different levels of experience with, and confidence in, risk
management, OPS expects some proposals to begin with approaches that are limited in
scope. Therefore, an operator may propose a phased entry into a demonstration project,
broadening the scope of the project as experience is gained. During the project approval
process, OPS will favor projects showing a potential for expansion and more
comprehensive application of risk management. OPS expects to work with companies to
develop a profile which compares the demonstration site to the rest of the pipeline.

OPS recognizes that significant benefits can accrue from even the less sophisticated
applications of risk management. Because no single risk management approach will be
universally appropriate for every situation, OPS is looking for those that match the level
of risk management with the complexity of the risks being managed. However, any
operator who participates in the Demonstration Program must have in place the program
elements defined in the Interim Risk Management Program Standard. The program
elements provide the structure for the limited scope proposal.

When an operator proposes risk control alternatives to implement during a demonstration
project, the operator should demonstrate a knowledge and understanding of the range of
risks along the demonstration site and show that it has considered significant failure
modes. An operator may draw on corporate experience, skills, and available
documentation to support the proposed alternatives.

(4) **OPS considers an operator's compliance with the provisions of an OPS-approved risk
management project to be an equivalent and acceptable alternative to compliance with
the regulations.**

OPS considers the provisions of an approved risk management project to be a regulatory
commitment. The terms and conditions of the project will be incorporated into an order
that is subject to enforcement authority. By this order, an operator conducting risk
management activities in an approved project will be exempt from regulations
corresponding to the stated scope of the project, but will be required to comply with the
provisions of the project. An operator not complying with the provisions of its OPS-
approved project will be subject to the same civil penalties administered under existing
regulations.
OPS has the authority to exempt, by order, an owner or operator participating in a risk management demonstration project from all or a portion of the regulatory requirements, and from any new regulations, applying to the covered pipeline facility. OPS could issue orders exempting participating operators from any but the reporting requirements in 49 CFR Parts 192 or 195, but expects that the projects approved in 1997 will require exemptions from only one or a portion of the regulations.

When the project concludes at the end of four years, or if it is terminated earlier, consideration will be given to installations or facility modifications made during the demonstration project that conflict with existing or future regulatory actions. Actions taken by the operator in good faith in an approved risk management project could be "grandfathered" and exempt from future regulatory compliance, provided safety and environmental protection are not compromised.

(5) The operator is responsible for active communication with state and local officials regarding risk management. OPS will ensure that such communication is part of the operator's demonstration project plan and that the communication is carried out.

OPS sees potential for risk management to provide better accountability to the public for safety and environmental programs. OPS is beginning to explore appropriate strategies for productive communication with public safety officials and the public, and for getting meaningful public input into the risk management process. Similarly, OPS realizes the importance of training and other information exchange in supporting the institutional change that would occur under risk management.

Companies must establish appropriate dialogue with state and local public safety and environment officials. At a minimum, these public officials should be aware that a risk management demonstration project is underway on the pipeline, that OPS is monitoring the project, and who functions as a point-of-contact. Such a dialogue would enable local officials to reassure the public that an appropriate regulatory presence is in place and how the overall safety and environmental protection are enhanced by risk management. OPS will discuss external communications with the operator during a consultation prior to formal application.

IV. Process for Selecting Projects

OPS is providing the following as guidance for operators to seek approval of their risk management demonstration projects. OPS plans to formally solicit operators to voluntarily participate in the risk management demonstration projects via a Federal Register Notice in first quarter 1997. That notice will give target dates for the various steps described below.

(1) Letter of Intent. Operators would notify OPS of interest in participating in a demonstration project, and OPS would screen operators to ensure that only companies whose demonstration
project concepts have a reasonable likelihood of being approved expend the resources to develop formal applications. OPS will screen Letters of Intent to identify no more than ten projects as candidates for selection in the Demonstration Program. Ten is the maximum number OPS can reasonably expect to evaluate and, if selected, to monitor. OPS would accept Letters of Intent during a 60-day window in early 1997. A Letter of Intent is an expression of a company’s interest, but does not obligate a company to participate in a demonstration.

OPS would require that a demonstration project cover any part or all of a pipeline system that is covered by either 49 CFR Part 192 or 195, is under federal oversight or oversight by a participating interstate agent, and is currently in operation or under conversion to service. Operators should commit to a project duration of at least four years, and provide evidence that they will address all considerations raised in the Interim Risk Management Program Standard. This includes providing a description of the means by which the company would communicate with local officials regarding its demonstration project.

OPS would like to choose operators who provide evidence of consistent corporate commitment to risk management. This could be demonstrated by a corporate officer, who controls the resource allocation for the demonstration project and competing operations, signing the Letter of Intent.

The Letter of Intent would include a general discussion of risk management principles as part of a company’s operating philosophy. To provide OPS adequate data to choose a diverse set of demonstration projects, the Letter would provide a brief system profile of the pipeline, including product(s) transported, pipeline age and operating history, types of population distributions and geographic conditions in proximity of the pipeline, and any other features the operator thinks are notable. The Letter would also describe the scope of the project as defined per the Interim Risk Management Program Standard and any new technologies and processes to be developed or deployed during the demonstration phase.

In making its choice, OPS would consider those operators who have clear records of safety and environmental compliance, based on OPS records and consultation with other interested agencies. OPS will also limit selection to projects which would achieve superior safety and environmental protection. Operators should have completed any OPS-initiated corrective actions.

OPS will publish for public comment a Federal Register notice describing proposals of selected companies and the demonstration sites under consideration. OPS will also follow through with national public, environmental and other interested organizations about the sites under consideration so that local officials can be notified and informed.

(2) Consultation. OPS would invite each operator submitting a promising Letter of Intent to a consultation within 60 days of receipt of the Letter of Intent. The purpose of the consultation would be to familiarize OPS and affected States with specific aspects of an operator’s risk
management project concept, to provide guidance to the operator on what refinements (if any) are needed for OPS to approve the concept as a demonstration project, to enable regulators to plan the expected level of monitoring based on the company’s own audit process, and to enable regulators and the operator to agree on the roles and responsibilities of each throughout the project duration. OPS intends that the consultation begin a negotiation process that results in a demonstration project that OPS could approve.

OPS will provide notification that encourages local officials and the public with questions about demonstration projects to raise them with state pipeline safety officials who can raise them in the consultation process.

OPS would constitute a Project Review Team (PRT) to consult with the operator, keep abreast of any subsequent discussions, and provide technical input on whether a demonstration project could be approved. OPS would customize the make-up of each PRT to the company and project. The PRT members’ roles would be defined in OPS-developed protocols, designed to ensure rigorous yet fair and consistent treatment of all operators throughout plan negotiation, approval, and monitoring. The mix of state’s and OPS regional personnel on the PRTs, as well as any outside technical expertise consulted, would vary from project to project depending on the demonstration’s technical focus and geographic location. Some of the same OPS headquarters staff would be on all PRTs to ensure consistent application of policy throughout the project and to follow all issues raised during the consultations to their resolution.

The consultation would focus on the design, operations, and maintenance practices that would replace practices required by 49 CFR Part 192 or 195, and that would achieve superior overall safety and environmental protection. The operator would provide the rationale for these risk control alternatives by generally describing the specific risk management models, processes, and sources of data supporting their selection.

Other consultation discussion topics would include the program goals, the project scope defined per the Interim Risk Management Program Standard, the project-specific performance measures, the operator’s auditing plan, a plan for OPS audits, proprietary issues, provisions for public communication, and the outline for a work plan including benchmarks, risk assessment processes, new technologies applied, points-of-disclosure, and mechanisms for monitoring and refinement.

(3) **Formal Application and Approval.** An operator would submit an application formally indicating its intent to enter into a risk management demonstration project. Consistent with the program standard’s intent for an efficient information flow among appropriate stakeholders, a summary of this formal application would be published in the Federal Register, and the application itself would be made available for review and comment in the docket. OPS will again communicate with national public, environmental and other interested organizations about the sites in which we intend to approve demonstration projects so that local officials can be notified and informed.

November 15, 1996
The formal application, including a detailed work plan, would document operator/PRT resolution of issues raised during the consultation and any subsequent discussions. It would also provide assurance of a corporate commitment to implement the project in accordance with the operator's risk management application. Other issues may be included at the operator's discretion, such as how to return to compliance with the regulations should a demonstration be terminated.

OPS would review the application and comments, and decide whether to approve the project. If OPS decides to approve the project, OPS would issue the operator a written order. The order, in addition to exempting an operator from the applicability of specified pipeline safety regulatory requirements for the period of the demonstration, would set forth the terms and conditions for the operator's participation in the demonstration project. The order would be enforceable.

(4) Implementation. A risk management project would start as soon as OPS approves the formal application and work plan, issues the order, and notifies the public through the Federal Register that the order is in effect. Regulators and operators would monitor risk management demonstration projects for compliance with the order. OPS would provide each participating operator with a plan describing the regulators' expected level of effort in monitoring the demonstration, including the type of audits, their frequency, the participants, the audit scope, and the operator's means of addressing those aspects of the demonstration site remaining in compliance with the regulations, but this plan would not limit OPS's statutory authority to inspect a pipeline facility during the period of the demonstration. Planned OPS audits would coincide with the operator's data taking at key decision points, such as when the operator evaluates the effectiveness of safety activities or considers modifying safety activities.

An operator would notify OPS of any intent to make substantive modifications to the risk management project once a demonstration is underway. The PRT may reconvene to renegotiate project approval or to resolve other significant issues. Provisions will be made for public review and comment on renegotiated projects.

OPS could, through appropriate administrative action, address any unsafe conditions that arise during the demonstration period to ensure that such conditions are quickly addressed. OPS would also administer civil penalties within the provisions of the existing regulations for operators not complying with the order.

(5) Termination. OPS intends that, where a risk management demonstration project is determined to have been successful, the operator could, in lieu of switching to compliance with the regulations, continue to exercise risk management on that part of the system that was covered by the demonstration. However, this determination could not be made until the end of the demonstration period. Upon conclusion of the project, or if it is terminated earlier, consideration would be given to installations or facility modifications made during the demonstration project that conflict with future regulatory actions.
OPS may consider terminating a demonstration project if:

(i) the operator requests termination due to changed circumstances;
(ii) the operator does not comply with the terms and conditions of the approved risk management project;
(iii) safety has been compromised; or
(iv) OPS and the operator fail to agree on a substantive modification to a risk management project.

V. Summary of Means of Achieving Meaningful Public and Community Involvement

OPS is providing numerous opportunities for public participation in the design and implementation of the Pipeline Risk Management Demonstration Program. One of OPS's objectives for the demonstrations is to establish a common framework for productive communication with public safety officials and the public, and for getting meaningful public input into the risk management process. OPS believes meaningful public input is essential if the demonstrations are to be successful.

The public was invited to comment on early regulatory framework concepts via Federal Register notices published in 60 FR 49040, September 21, 1995, and 60 FR 65725, December 20, 1995. OPS is soliciting public comment on the latest framework concepts via this notice. In addition to the notices, OPS has held two public meetings in preparation for the demonstrations and has scheduled a third for January 28, 1997, in New Orleans, LA. The previous public meetings were held on November 7, 1995, in McLean, Virginia, and on April 14-15, 1996, in Houston, TX. At the third meeting, OPS plans to present the final framework and supporting documents, and to demonstrate the review and approval process using prototype risk management projects.

This notice directs interested members of the public to the docket, to the American Petroleum Institute (API), or to a website to obtain and comment on the latest draft of the Interim Risk Management Program Standard. The standard describes the elements that OPS, its state partners, and industry agree must be common to all demonstration projects. One requirement is an external communications element, in which regulator and other stakeholder interests and concerns are understood, and program goals and results are communicated to and discussed with the public, as well as Federal, state, and local regulators, and other stakeholders as appropriate. The docket associated with this notice will have available for review any comments received on the standard and on the regulatory framework.

This notice also describes the numerous opportunities OPS is offering the public for comment during the demonstration review and approval process. Before formal applications are due, OPS will publish for public comment a Federal Register notice describing the demonstration projects under consideration and each company's concept for communicating with local safety officials should OPS approve its demonstration project. The public will be noticed again once the formal application is received and approval is imminent. At this time, a summary of the formal
application will be published in the Federal Register, and the application itself will be made available for review and comment through the docket. At each opportunity for notice in the Federal Register, OPS will communicate with national public, environmental and other interested organizations about the sites under consideration so that local officials can be notified and informed about planned program activities.

Affected states will be a part of the Project Review Team (PRT) recommending whether or not OPS should approve a demonstration project. OPS will provide notification that encourages local officials and the public with questions about demonstration projects to raise them with state pipeline safety officials who can raise them with the PRT.

OPS and industry’s communications effort focusing on public and environmental officials and other interested organization representatives is intended to provide these officials with adequate information to reassure the public that an appropriate regulatory presence is in place during the demonstrations, and to describe how safety and environmental protection will be enhanced by risk management. OPS would appreciate comments on whether these mechanisms are adequate to ensure public and community involvement, and if not, what OPS and operators choosing to participate in the demonstration projects can do to achieve such involvement.

VI. Report to Congress

By March 31, 2000, OPS will submit a Report to Congress on the results of the demonstration projects, evaluating how effectively safety, environmental protection, and reliability have been improved by participating operators, the feasibility of risk management in general, and recommending whether and in what form risk management should be incorporated into the Federal pipeline safety program on a permanent basis.
Risk Management Program Standard

For Use in the Pipeline Risk Management Demonstration Program

Produced by

The Joint Risk Management Program Standard Team

The Office of Pipeline Safety
American Petroleum Institute
Interstate Natural Gas Association of America
National Association of Regulatory Utility Commissions
National Association of Pipeline Safety Representatives
Gas Research Institute

January 17, 1997
Preface

The Accountable Pipeline Safety and Partnership Act of 1996 requires the Office of Pipeline Safety (OPS) to establish and implement the Pipeline Risk Management Demonstration Program. OPS has worked in partnership with the pipeline industry, state and local regulators, and other stakeholders to develop the basic building blocks of this Demonstration Program:

- *The Risk Management Demonstration Program Framework*, which describes the processes by which OPS will receive, review, approve, monitor, modify, and terminate company risk management demonstration projects;

- *The Risk Management Program Standard* (this document), which describes the essential elements and characteristics of a company’s risk management program;

- *Guidance on Performance Measures*, which outlines the processes to ensure that individual company demonstration projects and the overall risk management demonstration program are achieving their desired goals;

- *Risk Management Communications Plan*, which outlines the processes and mechanisms to be used to communicate objectives, status, and results of the Demonstration Program to all appropriate stakeholders.

- *Risk Management Training Curricula*, which describes the content of the risk management training course that will be provided to industry and regulator participants in the Demonstration Program.

Foundation of the

Risk Management Demonstration Program

<table>
<thead>
<tr>
<th>Program Framework</th>
<th>Performance Measures</th>
<th>Communication Plan</th>
<th>Training Curricula</th>
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</table>
Terminology

The Pipeline Risk Management Demonstration Program is the national program required by the Accountable Pipeline Safety and Partnership Act of 1996 and administered by OPS. The demonstration program is a four-year trial designed to evaluate risk management as a regulatory alternative.

A Risk Management Program is an individual operating company's overall risk management program.

A Risk Management Demonstration Project is that portion of a company's overall risk management program that is included within the pipeline risk management demonstration program.

A Risk Management Application is a summary document submitted by an individual company to OPS that describes its proposed risk management demonstration project.
## Contents

**I. Introduction** ............................................. I-1

I.1 Background .............................................. I-1

I.2 Purpose ............................................... I-2

I.3 Applicability .......................................... I-3

I.4 Scope ................................................ I-3

I.5 Guiding Principles ...................................... I-5

I.6 Organization of This Standard ......................... I-6

**II. Overview of a Risk Management Program** ........ II-1

II.1 Program Elements Overview .......................... II-1

II.2 Process Elements Overview .......................... II-3

II.2.1 Risk Assessment .................................. II-4

II.2.2 Risk Control and Decision Support ............. II-5

II.2.3 Performance Monitoring and Feedback .......... II-6

**III. Risk Management Program Elements** .............. III-1

III.1 Administration ....................................... III-1

III.1.1 Roles and Responsibilities .................... III-1

III.1.2 Personnel Qualifications ........................ III-1

III.1.3 Management of Change ........................... III-1

III.2 Communication ....................................... III-2

III.3 Documentation ....................................... III-2

III.4 Program Evaluation and Improvement ............... III-3

January 17, 1997
Contents (Continued)

IV. Risk Management Process Elements .................................................. IV-1
   IV.1 Risk Assessment ................................................................. IV-1
       IV.1.1 Scoping and Screening Analysis .................................. IV-1
       IV.1.2 Event Identification .................................................... IV-3
       IV.1.3 Frequency Analysis ..................................................... IV-6
       IV.1.4 Consequence Analysis .................................................. IV-7
       IV.1.5 Risk Estimation .......................................................... IV-7
   IV.2 Risk Control and Decision Support ......................................... IV-8
       IV.2.1 Identification of Risk Control Issues ............................ IV-8
       IV.2.2 Identification of Risk Control Options .......................... IV-10
       IV.2.3 Evaluation and Comparison of Risk Control Options ........ IV-13
       IV.2.4 Selection of Risk Control Options ................................ IV-14
   IV.3 Performance Monitoring and Feedback ................................... IV-15
       IV.3.1 Selection of Performance Measures ............................... IV-17
       IV.3.2 Monitoring and Evaluating Performance ......................... IV-20
       IV.3.3 Modifications to the Risk Management Program ............... IV-20

V. Conclusions ................................................................................. V-1

Appendix A. Joint Risk Management Program Standard Team ............. A-1

January 17, 1997
Figures

II-1. Risk Management Program Overview .................................. II-2

IV-1. The Risk Assessment Process Element ............................... IV-2

IV-2. Progression of a Pipeline Incident .................................... IV-4

IV-3. The Risk Control and Decision Support Process Element ......... IV-9

IV-4. Risk Control Activities During Progression of a Pipeline Incident .......... IV-11

IV-5. The Performance Monitoring and Feedback Process Element ........ IV-16

IV-6. Performance Measures Associated with Stages of a Pipeline Incident .... IV-18
I. Introduction

I.1 Background

The first priority of the United States pipeline industry, the Office of Pipeline Safety, and state pipeline regulators is to protect the public, the environment, and property while maintaining an efficient and reliable pipeline system. Currently, the primary regulatory basis for achieving these safety goals in the pipeline industry is the set of regulations embodied in Title 49 of the Code of Federal Regulations Parts 190-199. In addition, pipeline companies perform many discretionary activities over and above the regulations to achieve these goals. Both the industry and regulators are looking for alternative approaches to further improve safety in cost-effective ways.

"Safety" is the protection of the public, the environment, and property. "Risk" is any threat to achieving those goals. Industry and regulators have used risk-based decision-making in a variety of ways. Both industry and regulators believe that formalized, comprehensive risk management programs have the potential to help further improve safety and allocate resources cost effectively, by:

- Identifying and analyzing the precursor events and causes of potential pipeline incidents
- Examining both the likelihood and severity of potential pipeline incidents
- Providing a comprehensive and integrated means for examining and comparing the complete spectrum of risks and prevention/mitigation strategies
- Providing a structured, easily communicated means for identifying and prioritizing pipeline risks and risk-reduction measures
- Establishing and tracking performance measures to ensure safety improvement.

The industry and regulators formed two partnership teams to investigate the potential application of risk management within the pipeline industry. The Liquid Risk Assessment Quality Team (RAQT), jointly sponsored by the Office of Pipeline Safety (OPS) and the American Petroleum Institute (API), examined the potential use of risk management within the hazardous liquid pipeline industry. The Gas Risk Assessment Quality Team, jointly sponsored by the OPS and the Interstate Natural Gas Association of America (INGAA), examined the potential use of risk management within the natural gas pipeline industry.
Both teams concluded that risk management had the potential to produce superior safety in a more cost-effective manner than the current regulatory scheme, but recommended that a multiyear Pipeline Risk Management Demonstration Program be implemented to determine the feasibility of risk management programs within the pipeline industry and to ascertain the practical benefits that can be derived from such programs.

These teams' recommendations were discussed in a public conference on risk management in November 1995. This conference resulted in acceptance of the Pipeline Risk Management Demonstration Program with the stipulation that a standard be developed that would define the necessary elements and characteristics of a company's risk management program. As a result of the November 1995 risk management conference, a joint risk assessment quality action team (JRAQT) was formed to develop the risk management demonstration program standard.

1.2 Purpose

The program standard is intended to serve as a common rational basis upon which the pipeline industry and its regulators can interactively develop, assess, and refine effective risk management programs and demonstration projects. It is not intended to provide a detailed instruction manual that can be followed by rote by pipeline companies to develop a risk management program or a demonstration project application, or a checklist for OPS to use to review company risk management applications.

This program standard defines the program and process elements of a comprehensive risk management program that all risk management demonstration projects shall contain. At the same time, the standard allows flexibility to each company to customize its risk management program to fit its particular needs and corporate practices, provided that the program supports the scope and goals of the demonstration project. This program standard also includes an evaluation and improvement element that enables programs to evolve as experience is gained.

This program standard plays an important role in the Pipeline Risk Management Demonstration Program. This program standard, by describing the necessary basic elements and characteristics of a pipeline company risk management program, is to be used by:

- Individual pipeline companies that are developing risk management programs for internal use

- Individual pipeline companies that are developing specific demonstration project applications to submit for consideration within the Risk Management Demonstration Program

- OPS as a basis for developing the processes it will use to review risk management programs and approve specific demonstration project applications submitted by individual companies.

I-2 January 17, 1997
This program standard will be updated and refined as lessons are learned from the demonstration program. It is anticipated that this program standard will provide a starting point for the development of one or more national consensus standards or industry recommended practices.

I.3 Applicability

This program standard is applicable to risk management programs that include any designated portion, or the entirety of any hazardous liquid or natural gas pipeline system and all associated design, construction, testing, operations, maintenance, and abandonment activities. A pipeline system includes all physical facilities through which hazardous liquids or gas moves in transportation, including, but not limited to, pipe, valves, other appurtenances attached to pipe, pumping units, compressor units, metering stations, regulator stations, delivery stations, holders, breakout tanks, and fabricated assemblies.

I.4 Scope

This program standard outlines a comprehensive risk management program, including:

- The application of risk management to any or all portions of the pipeline life cycle, including design, construction, testing, operations, maintenance, and abandonment

- The complete risk management process, including risk assessment, risk control and decision support, and performance monitoring and feedback

- The integration of risk management into the corporation's business practices, including administration, communication, documentation, and program evaluation.
I.5 Guiding Principles

The following guiding principles describe the overriding attributes and characteristics that all risk management programs should exhibit. These guiding principles are reflected in the individual sections of the standard, and can be used by developers and reviewers of risk management programs to place in appropriate context the individual portions of this standard and to help ensure that the expected outcomes of the integrated program will be achieved by the collective effect of the program's individual parts.

1. **Risk Management is a comprehensive management decision support process, implemented as a program, integrated through defined roles and responsibilities into the day-to-day operations, maintenance, engineering, management, and regulatory decisions of the operator.**

Risk management produces, structures, and presents the best available risk information to support and facilitate better management decision making.

Risk management allows management decisions and their bases to be more easily communicated.

Risk management is a comprehensive management decision making process that includes the identification and analysis of risks; the identification, analysis, and selection of alternative measures to control risks; and the subsequent assessment of performance.

Risk management does not replace pipeline company managers or regulators with computer models. Corporate managers and regulators make decisions. These decisions are aided by, but not dictated by, technical models and quantitative analyses.

Risk management is an integrative process, allowing operators and regulators to address multiple aspects and practices of pipeline design, construction, testing, operation, maintenance, and abandonment in a combined, holistic way to maximize overall benefits.

Risk management is a continuous process, with initial output from any portion of the process often being updated and refined using information fed back from subsequent portions of the overall decision making and implementation process.

Risk management requires corporate management leadership, commitment, and accountability. Clear lines of responsibility and accountability for risk management need to be established from the highest level of management down.
2. *Risk cannot be totally eliminated.*

Risk is an inherent part of life and is associated with all industrial activities.

The overall risk of a pipeline can be reduced, controlled, or altered, but it cannot be reduced to zero.

The process or result of reducing risks of one source or type can affect risks of another source or type.

3. *Risk can be controlled through the cost-effective application of finite resources.*

Risk management logically structures, brings consistency to, documents, and clarifies the trade-offs of risks, uncertainties, and benefits among competing alternatives.

Risk management inherently involves subjective trade-offs among different, and often competing, goals.

Risk management allows experienced operators and regulators to apply best engineering practices and judgment to develop integrated solutions to pipeline safety problems as an alternative to event-driven, regulatory-dictated solutions.

4. *Risk management increases, integrates, and enhances the value of information concerning pipeline safety.*

Risk management requires suitable and sufficient data to be developed and maintained concerning system design and operational characteristics, including reliability and maintenance histories of pipeline system components. In many cases this information exceeds that which is currently developed, maintained, and reported.

Risk management addresses both the likelihood and consequences of pipeline incidents. In this context, “incidents” refers to unwanted events such as unintended releases, leaks, and near misses.

Risk management addresses the entire life cycle of the pipeline system, considering the interfaces and dependencies among pipeline design, construction, operation, and maintenance.

Risk management examines the entire spectrum of risks, from the relatively frequent minor events that pose little or no risk, to the very low probability incidents that could cause significant harm.
Risk management identifies and assesses the relative merits of activities to reduce the likelihood of incidents as well as activities to mitigate the consequences of incidents should they occur.

By placing each source of risk in its proper perspective, and by depicting the relative impact of potential risk-reduction measures on overall risk, risk management can facilitate communication among operators, regulators, and the public concerning the nature of pipeline risks and the rational basis for decisions on how to manage these risks.

5. Risk management programs are structured but flexible, allowing customized approaches to be developed for specific issues and situations, encouraging innovation, and supporting continuous improvement.

There are numerous levels of detail and model complexity that can be beneficially developed and implemented within a risk management program. The technical models used within the program should be commensurate with the level and type of the risks being analyzed, and should be capable of generating the level of information detail and confidence needed to support the specific decisions being made.

Risk management programs should be implemented as ongoing, “living” programs, evolving and continuously improving as experience is gained and new data are obtained.

6. The implementation of a risk management program should result in superior public safety and environmental protection.

Risk management programs include performance measures and call for explicit and visible monitoring, tracking, and reporting of progress against expected outcomes.

Risk management programs, data, and results are structured in a manner that can be audited.

1.6 Organization of This Standard

This standard presents a summary overview of risk management programs and processes (Section II), followed by a detailed explanation of program elements (Section III) and process elements (Section IV). It concludes with a statement of implications for industry, the public, and the regulatory community. A roster of the Program Standard Team appears in Appendix A.
II. Overview of a Risk Management Program

A risk management program can be structured in many ways, but all programs shall contain the key program and process elements described below (see Figure II-1).

II.1 Program Elements Overview

Program elements are those portions of the overall corporate programmatic infrastructure that ensure that risk management is developed and implemented as an integral part of the day-to-day business practices of the company. Those corporate programmatic infrastructure elements include:

- **Administration.** Corporate policies and administrative procedures shall include the implementation of risk management programs, including establishment of program goals, and assignment of roles and responsibilities for risk management activities. The processes used by the corporation to ensure personnel qualifications shall ensure that individuals have the necessary experience and skills to perform their risk management roles and responsibilities.

- **Communication.** The organization's internal communication processes shall ensure that information concerning the goals of the risk management program, structure and processes, relevant input data, and risk management results and decisions are communicated throughout the organization. The organization's external communication processes should ensure that regulator and other stakeholder interests and concerns relative to risk management are considered, and that risk management program goals and results are communicated to and discussed with Federal, State, and local regulators, the public, and other stakeholders as appropriate.

- **Documentation.** The organization's documentation processes and systems shall include the acquisition, processing, storing, and reporting of risk management data and information.

- **Program Evaluation and Improvement.** The organization's program evaluation processes and systems shall ensure that the risk management program's activities, decisions, and results are continually monitored, to assess progress in managing risk, and to improve the overall risk management program.

Risk Management Program Elements are addressed in detail in Section III of this program standard.
Figure II-1  Risk Management Program Overview

Program Elements

Administration
Roles & Responsibilities
Personnel Qualifications
Management of Change
Communications
Documentation
Program Evaluation and Improvement

Process Elements

Risk Assessment
What is the Scope of the Risk Assessment?
What Adverse Events Can Happen?
How Likely are These Events to Occur?
How Severe Would the Consequences Be if the Events Did Occur?

Risk Control & Decision Support
What Could Be Done to Control Risks?
What Are the Relative Merits of the Risk Control Options?
What Set of Activities Best Achieves Risk Management Goals?

Performance Monitoring & Feedback
What Improvements are Expected to Result from the Risk Control Decisions?
What Measures Best Capture These Expected Outcomes?
Are the Selected Risk Control Activities Having the Intended Effect?
How Can the Overall Risk Management Process be Improved?
II.2 Process Elements Overview

Risk management process elements are the technical and analytical portions of a risk management program needed to assess risks, identify possible ways to control these risks, allocate resources to control risks, monitor performance, and apply information learned to improve the process.

Figure II-1 depicts the major risk management process elements. Although there is a natural, logical flow to the process elements, risk management programs are, in practice, iterative processes with considerable interaction and feedback among the process elements. Initial risk assessment activities may be expanded or re-examined based on the outcome of subsequent activities to define effective risk control measures. The monitoring of performance may suggest that initial assumptions or data were inadequate, and need to be updated or rethought. A risk management program is a dynamic process, which continually develops new data and information that can be used in each step of the process to make improved and better informed decisions.

The first key step of a risk management program is defining the scope of the program. The initial scope definition includes:

- The physical boundaries of the pipeline system or segment that will be addressed
- The portions of the life cycle that will be addressed (e.g., will design and construction issues be examined, or will the study focus on operational and maintenance problems and solutions?)
- The breadth of the analyses (e.g., will all types of failure modes and potential solutions be considered, or will the program focus on specific types of failure modes?).

The scope of the demonstration project shall be consistent with the goals of the company's risk management program. A screening level risk assessment (see next section) can often be effectively used to help focus the scope of the risk management program on the most important issues and opportunities for improvement. Limited, focused-scope risk management programs are, in fact, often a prudent way of introducing a risk management program into an organization, allowing experience and skills to be developed in a controlled manner. However, the scope of the risk management program shall consider system components and failure modes that have a significant effect on risk management conclusions and decisions.
II.2.1 Risk Assessment

The Risk Assessment portion of a risk management program addresses the following basic questions:

What adverse events can happen?

- What types of adverse consequences are of concern and will be addressed by the risk management program?
- What event or series of events would have to occur to cause these undesirable consequences?
- How could these events occur (i.e., what are the logical combinations of possible contributing causes that would result in these events)?

How likely are these events to occur?

How severe would the consequences be if the events did occur?

- Given the occurrence of the event(s), what are the specific physical mechanisms or pathways by which the event could lead to harm to the public, employees and contractors, the environment, private and public property, or other valued entities?
- What would be the expected size or severity of the release of hazardous material from the event?
- What would be the nature and severity of the impact of the event(s) on the public, employees and contractors, the environment, private and public property, business, or other valued entities?

Inputs to the risk assessment typically include data and information about the design and age of the pipe, the soil surrounding the pipeline and other external factors, operational and maintenance practices, operating history, test history, inspection findings, and the proximity and distribution of population, third party construction activities, environmentally sensitive areas, and unusually sensitive areas.

The risk assessment element results in an understanding of the “risk profile”: the contributors to the overall risk of the segment of pipeline being analyzed, and the relative importance of each of these contributors. This understanding of the current risk profile provides the basis for defining and deciding among ways to reduce these risks, which is the next step in the risk management process.
Risk assessments are often performed in a tiered or iterative manner. For example, a screening level, or "first-cut" risk assessment, employing less detailed analyses, can be used to define the initial scope of the program and identify those areas where more detailed analyses should be performed first. Screening analyses are useful to focus and prioritize the performance of more detailed risk analyses, but can overlook significant risks. Both screening and detailed risk assessments should be re-visited on a regular basis to ensure that information and insights gained from risk assessments of other portions of the pipeline, the risk control and decision-support process, the performance monitoring program, analysis of industry pipeline incidents, or other sources is appropriately reflected in the analysis.

Risk assessment is addressed in more detail in Section IV.1 of this standard.

II.2.2 Risk Control and Decision Support

In this portion of the risk management program, the organization examines options for controlling the risks identified in the previous step and makes decisions concerning which specific risk control activities to perform and when to perform them.

A "risk control activity" can be a current practice or a change in the way that the pipeline is designed, constructed, tested, operated, or maintained for the purposes of improving the risk profile of the pipeline. For example, risk control activities can include additions of isolation valves, increases (or decreases) in surveillance or testing intervals, changes in the timing or nature of a maintenance activity, operating the system under different conditions, etc.

The expected outcome of this step is the identification of an overall set of risk control activities that collectively achieves the risk management goals of the operating company and produces superior safety.

Risk control and decision support address the following questions:

What could be done to control risks?

- Given our understanding of the current risk and its contributors, where can improvements in design, construction, testing, operations, or maintenance be made to reduce risk or more efficiently control risk?

- What are possible ways of reducing the likelihood of events?

- What are possible ways of reducing the consequences of events?
What are the relative merits of the various risk control options?

- How much does each option affect each type of risk?
- How much does each option cost to implement?
- What are other benefits or incremental costs of each option?

What set of activities best achieves risk management goals?

- What are the most cost-effective risk control options?
- Are there additional compensatory actions that can be performed to cost-effectively control residual risks?
- In addition to risk reduction and cost, what other factors will be considered in choosing among risk control activities?
- How can the various options be integrated to produce an overall set of changes that achieves the risk management goals?
- How can available resources be allocated to most efficiently implement the activities over time?
- Should additional resources be committed to reduce risks?

Risk control and decision support are addressed in more detail in Section IV.2 of this standard.

II.2.3 Performance Monitoring and Feedback

In this portion of a risk management program, the organization establishes performance measures and tracks progress to ensure that the intended effects of its actions are being achieved.

Performance monitoring and feedback address the following questions:

What improvements are expected from the risk control decisions?

- What changes in performance are expected from the selected set of improvements?
How would these changes be expected to manifest themselves in the short, intermediate, and long term?

What measures best capture these expected outcomes?

- What can be measured or observed in the short term and over the long term to determine if the specific applications of risk management are producing the desired results?

- How can the organization demonstrate superior safety and environmental protection?

Are the selected risk control activities having the intended effects?

- Does actual experience confirm predictions?

How can the overall risk management process be improved?

- Given actual experience, does the organization need to change its decisions?

- How should the risk assessment and risk control processes be updated to reflect new experience?

Performance monitoring and feedback are addressed in more detail in Section IV.3 of this standard.
III. Risk Management Program Elements

Risk management program elements form the foundation of the organizational infrastructure that supports the analytical and technical process elements of risk management. Risk management program elements deal with the overall functioning of the risk management program. The content and complexity of the risk management program elements shall be consistent with the degree of risk, the comprehensiveness of the risk management program, the quantity and quality of data available, and corporate organizational capabilities. While there are many ways to structure a risk management program, all programs shall contain elements that address administration, communication, documentation, and program evaluation.

III.1 Administration

The risk management program should be documented to ensure that the risk management policies are established, understood (both within and outside the organization), implemented, and maintained. The risk management program shall be an integral part of normal operations. Procedures must be established for conducting the risk management program. These policies and procedures address a number of administrative requirements, including:

III.1.1 Roles and Responsibilities

The risk management program documentation shall define roles and responsibilities for conducting risk management activities within the operator’s organization. Risk management should be integrated into existing functions where appropriate. Authority for decisions and necessary resources shall be defined.

III.1.2 Personnel Qualifications

Qualified personnel are essential for execution of an effective risk management program. The risk management plan shall describe the personnel qualifications necessary for the roles and responsibilities assigned, and define the processes that will be used to ensure that personnel performing risk management tasks possess the necessary qualifications.

III.1.3 Management of Change

The risk management plan shall include a discussion of the operator’s management of change procedures. Management of change applies to approval and documentation requirements for both procedural and physical changes related to design, construction, operations, and maintenance of pipeline facilities; and procedural changes associated with the risk management program. Risk management programs should include mechanisms for gathering and assimilating new information on pipeline surroundings and conditions as situations that may affect risk change over time.
III.2 Communication

An efficient flow of information among appropriate stakeholders, both internal and external to the operating company, enhances the quality of the analyses, improves decision making, facilitates review, and builds trust.

A risk management program shall contain an internal communications element, in which information concerning the goals and implementation of the risk management program, relevant input data, and results obtained are communicated throughout the organization. A risk management program shall also contain an external communications element, in which regulator and other stakeholder interests and concerns are understood, and program goals and results are communicated to and discussed with Federal, state, and local regulators, the public, and other stakeholders as appropriate.

A risk management program shall include a formal communications plan that identifies the types of information to be communicated and the audiences to receive that information (e.g., employees, operators of other adjacent facilities, regulatory agencies, other government agencies, emergency response agencies, the general public, the affected public). Risk management programs also shall include the methods of communication (e.g., public meetings, citizen advisory panels, printed materials, videotapes, telecommunications), individuals or organizations responsible for these communications, and the methods that will be employed to receive information from these audiences.

III.3 Documentation

The risk management program shall collect and maintain documentation of the inputs, analyses, and outputs of each element of the risk management program. This documentation supports efficient internal implementation of each step of the risk management process and allows key risk management results and decisions to be traceable and defensible. The risk management program may draw on existing documentation within a company and will produce new documentation requirements associated with the risk assessment, risk control decisions, and performance monitoring.

A risk management program shall include a documentation plan that describes how the company will acquire, process, store, report, maintain, verify, and modify relevant risk management data and information (e.g., program plans and procedures, specific technical analyses with input data and assumptions, training records).
III.4 Program Evaluation and Improvement

In order to determine, report, and improve the effectiveness of the risk management program, a risk management program shall include a planned and structured evaluation of its activities and processes. Evaluation thus serves as a quality element supporting continuous improvement of the risk management program.

The risk management program shall include an evaluation plan that periodically examines and reports:

1. The status and effectiveness of the administrative, communication, and documentation program elements

2. The status and effectiveness of the analytical processes used to assess risks, identify possible ways to control these risks, allocate resources to control risks in the most cost-effective way, and monitor performance

3. The impacts of risk management decisions on the choice of performance measures

4. The conclusions about program effectiveness resulting from performance monitoring and feedback

5. Modifications and actions for continuous improvement.
IV. Risk Management Process Elements

Process elements are the technical and analytical activities needed to assess risks, identify possible ways to control these risks, allocate resources to control risks in the most cost-effective way, and monitor performance. While there are many ways to structure an overall risk management process, all processes shall contain the following elements.

IV.1 Risk Assessment

The first step of the overall risk management process is to identify and understand the specific risks that must be managed. The Risk Assessment portion of a risk management program addresses the following basic questions:

- What types of risks will be addressed? (Section IV.1.1)
- What adverse events can happen? (Section IV.1.2)
- How likely are these events to occur? (Section IV.1.3)
- How severe would the consequences be were the events to occur? (Section IV.1.4)
- How is a risk profile developed? (Section IV.1.5)

The risk assessment process element, and its relationship to the other risk management process elements is illustrated in Figure IV-1.

IV.1.1 Scoping and Screening Analysis

A key first step in risk assessment is defining the scope of the analysis. The scope definition provides the framework and boundaries for the entire risk assessment process, and therefore must be well defined at the beginning of the process. An operator's risk management program shall contain a scope definition that includes:

- The physical boundaries of the pipeline system that will be addressed
- The portions of the life cycle that will be addressed (e.g., will design and construction issues be examined, or will the study focus on operational and maintenance problems and solutions?)
- The breadth of the analyses that will be addressed (e.g., will all types of failure modes and potential solutions be considered, or will the program focus on specific types of failure modes?).
Figure IV-1
The Risk Assessment Process Element

**Risk Assessment**
Estimate the frequency and consequences of potential incidents  
(Section IV.1)

**Scoping and Screening Analysis**
Define the physical and analytical boundaries of the assessment  
(Section IV.1.1)

**Event Identification**
Identify the events that could cause pipeline failures and lead to adverse consequences  
(Section IV.1.2)

**Frequency Analysis**
Estimate how often the events might occur  
(Section IV.1.3)

**Consequence Analysis**
Estimate the severity of the adverse impacts should the events occur  
(Section IV.1.4)

**Risk Estimation**
Combine frequency and consequence estimates into relative risk values  
(Section IV.1.5)

**Risk Control & Decision Support**
Select activities to reduce risk or produce superior safety more efficiently  
(Section IV.2)

**Performance Monitoring & Feedback**
Determine if the risk control decisions produce the anticipated outcomes  
(Section IV.3)
The scope of the risk assessment shall be consistent with the overall goals of the operator's risk management program. Although successful risk management programs usually expand their scope and become more comprehensive over time, it is often not necessary to perform a detailed risk assessment of an entire pipeline system as the first step of a pipeline risk management program. There are a variety of useful ways of initially limiting the scope of a detailed risk assessment, including:

1. A "screening" analysis that identifies those segments of the pipeline that are in or near high population zones or areas unusually sensitive to environmental damage, or that have experienced poor operating histories, and therefore could reasonably be expected to pose relatively higher risks than other portions of the pipeline.

2. The identification of specific issues by operators or regulators that appear to pose higher than average risks or provide opportunities for more cost-effective risk control (e.g., significant new residential or commercial construction in the immediate area, corrosive soil conditions, etc.).

3. The existence of special circumstances or characteristics of a specific segment of the pipeline (e.g., it is about to be transferred to another company, it shares characteristics with another pipeline in which a serious event has occurred, etc.).

Risk management programs with a limited scope are often a prudent way of introducing risk management programs into an organization, allowing experience and skills to be developed in a controlled manner. However, the scope of the risk management program shall include system components and failure modes that have a significant effect on the risk management conclusions and decisions.

The risk management program shall define and document the scope and purpose of the risk assessment, including any preliminary evaluations and screening analyses that may be undertaken. Assessments are expected to continuously improve over time, and periodic updates will be a part of the risk management program documentation (see Section III.3).

The system being analyzed is defined by providing a general system description, including boundaries, environment, and operating conditions. Any assumptions and constraints applicable to the system, the events, and the methods used shall be stated in the scope.

**IV.1.2 Event Identification**

Figure IV-2 depicts the progression of a pipeline incident. In pipeline risk management, the condition that exists with the potential for causing undesirable consequences (i.e., the "hazard") is the presence of hazardous liquids or natural gas within the pipeline. The accidental release of these substances can potentially cause uncontrolled dispersal of these substances.
Hazardous liquid or gas contained and delivered during normal operation

Precursor, initiating or contributing events of a pipeline incident; start of the accident event sequence (e.g., coating disbond, mechanical damage)

Loss of containment of hazardous liquid or gas; product migrates along available pathways to people, environmental resources, etc.

Adverse consequences to people, the environment, etc.
substances, with the possibility of associated fires, explosions, property damage, or environmental impacts.

A pipeline incident is the result of one or more events in a sequence that lead to loss of pipeline integrity and loss of containment of the liquid or natural gas product. Each of these events in the sequence may have one or more potential causes. For example, a rectifier failure can lead to loss of cathodic protection, which can lead to corrosion, which can lead to loss of containment. The rectifier failure itself may be caused by random component failure, lightning, etc.

A risk assessment identifies the specific events or combinations of events that could lead to loss of pipeline integrity and unintended release of product, and delineates the potential causes of these events. In subsequent risk assessment steps, the likelihood of these specific events and the severity of consequences associated with them will be estimated.

An operator's risk management program shall describe the processes, tools, and models by which pipeline incidents and their causes are identified. Pipeline incidents can be identified in a variety of ways with varying levels of detail and sophistication, including:

- Knowledge-based processes, in which the experience of operations and maintenance personnel concerning the causes of pipeline incidents is systematically captured through interviews, checklists, failure modes and effects tables, etc.

- Data-based processes, in which the documented operating history (in the form of incident reporting systems, maintenance histories, etc.) of the pipeline or other, similar pipelines is examined to identify causes.

- Logic-based processes, in which logic models are constructed to search for and identify potential causes of pipeline incidents by systematically breaking the incidents into their contributing causes (e.g., fault trees), or by following the possible outcomes that can result from a postulated initiating event (e.g., scenario models, or event trees).

The level of detail and sophistication of the risk assessment processes and models shall be commensurate with the level of risk being evaluated and shall be able to provide the level of precision necessary to support the specific risk control decisions being made. An operator's risk management program shall justify the appropriateness of the level of detail of the risk assessment models.
IV.1.3 Frequency Analysis

Once the series of events that could lead to pipeline incidents and consequential impacts are identified, it is necessary to estimate the relative likelihood that these events will actually occur. Frequency analysis provides estimates of the relative likelihood of the event or events that lead to pipeline incidents and to adverse consequences.

Frequencies of events can be estimated in either qualitative or quantitative terms, or both. Qualitative processes often use relative categories such as “frequent,” “likely,” “unlikely,” or “rare” to depict the likelihood of experiencing an event. Often, the qualitative categories are calibrated to ranges of quantitative frequencies (e.g., “likely” may be assigned to events with an expected frequency between 1 and 5 events per year). Quantitative processes estimate the expected number of events per unit time (e.g., 10 times per year). Semiquantitative processes often use a numeric index to estimate the relative frequency of events. For example, the frequency of third party damage events may be assigned an index score of 30, and corrosion events may be assigned an index score of 10, indicating that third party damage events are expected to occur three times as frequently as corrosion induced events.

As with event identification, frequency estimation can be performed at varying levels of detail and sophistication, including:

- Knowledge-based processes, in which expert opinion is used to estimate the frequency of events based on experience of knowledgeable operators, inspectors, etc.

- Data-based processes, in which event frequencies are derived from documented operating history (in the form of incident reporting systems, maintenance histories, etc.) of the pipeline or other, similar pipelines.

- Logic-based processes, in which logic models (e.g., fault trees or event trees) are constructed to mathematically combine the frequencies of causal events or series of events into an estimate of pipeline incident frequency. Logic-based processes are often used when insufficient operating data exists to estimate directly the frequency of very rare events.

An operator's risk management program shall describe the processes, tools, and models by which the frequency of pipeline incidents is to be estimated. An operator's risk management program shall define and justify the appropriateness of the level of detail of the risk assessment models. Limitations or uncertainties in the analysis shall be documented.
IV.1.4 Consequence Analysis

Consequence analysis involves estimating the severity of the impacts of the identified event or sequence of events on the health and safety of people, the environment, availability of service, business, or other impacts included in the operator’s risk management program.

Consequence analysis must consider not only the events that lead up to loss of pipeline containment, but other events (e.g., success/failure of remotely operated isolation valves to close) and considerations (e.g., population distribution) that could affect the severity of expected consequences. Consequence analysis shall consider at a minimum:

1. The amount of hazardous substance that is released

2. The physical pathways and dispersal mechanisms by which the substance can reach and impact employees or the public, or cause environmental damage

3. The amount of substance that would actually be expected to reach employees, the public, or the environment through these pathways

4. The expected effect of the released substance.

Consequences of events can be estimated in either qualitative or quantitative terms, or both. Qualitative processes often use relative categories such as “severe,” “significant,” “moderate,” or “insignificant” to depict the severity of consequences from an event. Often, the qualitative categories are calibrated to ranges of quantitative consequences (e.g., “significant” might be assigned to events with an expected consequence of between 1 and 5 serious injuries per year). Quantitative processes estimate the expected severity level in terms of number of fatalities, serious injuries, etc. Semi-quantitative processes often use a numeric index to estimate the relative consequences of events. For example, an event that is expected to lead to a fatality might be assigned an index score of 100, an event that leads to a serious injury might be assigned a smaller index score, and an event that leads to moderate property damage might be assigned a still smaller index score to indicate the relative harm associated with these impacts.

An operator’s risk management program shall describe the processes, tools, and models by which the consequences of pipeline incidents are estimated. An operator’s risk management program shall define and justify the appropriateness of the level of detail of the consequence models. Limitations or uncertainties in the analysis shall be documented.

IV.1.5 Risk Estimation

Risk estimation is the process of combining frequency and severity estimates into a risk value. The frequency and consequence estimated for each of the various identified events or sequences of events are combined into a risk value for that event sequence. The risk values for all identified event sequences can be combined into an overall risk value for the pipeline.
system or segment. The risk values may be qualitative, quantitative, or a combination of both, depending upon the processes used for frequency and consequence analysis, and the goals of the operator's risk management program.

This portion of the risk assessment process results in a "risk profile," or an overall depiction of pipeline risk and its constituent parts. This risk profile will be used in the subsequent risk management process element to identify and assess potential actions to control existing risks. Risk profiles that maintain discernible estimates of frequency and severity allow distinctions to be made between low frequency/high severity events and high frequency/low severity events as well as total risk values.

An operator's risk management program shall describe the processes, tools, and models by which the frequencies and consequences of pipeline incidents are combined into overall risk values. An operator's risk management program shall define and justify the appropriateness of the level of detail of the risk estimation models. Limitations or uncertainties in the analysis shall be documented.

IV.2 Risk Control and Decision Support

The previous section of this standard describes the basic processes by which a pipeline company can identify and assess the risks associated with its pipeline systems. This section describes the processes by which the pipeline company identifies, evaluates, and chooses among alternate means to control those risks.

The Risk Control and Decision Support portion of a risk management program addresses the following basic questions:

What could be done to control risks? (Sections IV.2.1 and IV.2.2)

What are the relative merits of the various risk control options? (Section IV.2.3)

What set of activities best achieves risk management goals? (Section IV.2.4)

The risk control and decision support process element, and its relationship to the other risk management process elements is illustrated in Figure IV-3.

IV.2.1 Identification of Risk Control Issues

Risk management programs shall include formalized and structured processes to identify those specific situations where it may be possible to reduce risk, or to maintain risks at current levels in more cost-effective ways. These "risk control issues" represent potential opportunities to improve the level of protection of the public, the environment, and property by making changes to the way that the pipeline is designed, constructed, operated, or maintained. The primary goal of a company's risk management program is to provide corporate management
Figure IV-3

The Risk Control & Decision-Support Process Element

- **Risk Assessment**
  Estimate the frequency and consequences of potential incidents
  (Section IV.1)

- **Risk Control & Decision Support**
  Select activities to reduce risk or produce superior safety more efficiently
  (Section IV.2)

- **Identification of Risk Control Issues**
  Define the major contributors to risk and opportunities for more efficient control of risks
  (Section IV.2.1)

- **Identification of Risk Control Options**
  Define specific alternatives to current design and operation that reduce risk or increase efficiency
  (Section IV.2.2)

- **Evaluation & Comparison of Options**
  Select the best set of design and operational practices that produce superior safety
  (Section IV.2.3)

- **Performance Monitoring & Feedback**
  Determine if the risk control decisions produce the anticipated outcomes
  (Section IV.3)
with information to support decisions about what specific actions, if any, should be taken to address these issues.

These risk control issues may have been identified in the original scoping of the risk management program (e.g., a maintenance manager's concern that a current maintenance practice may not be the most cost-effective way of controlling risk) or may result from a review of the risk assessment of the pipeline system (e.g., the identification of a pipeline segment with a relatively high risk due to corrosion).

Risk control issues could include:

- Substantial contributors to overall pipeline system risk
- Situations where the risk, while not a major contributor to current pipeline risk, might still be cost-effectively reduced
- Situations where the currently applied or required risk control mechanisms may be more costly than equally effective, alternative mechanisms.

IV.2.2 Identification of Risk Control Options

Risk management programs shall include formalized and structured processes that specify risk control options for addressing the risk control issues identified in the previous step. Risk control options include those that:

- Alter or replace a design, construction, testing, operational, or maintenance practice in such a way that the current likelihood of pipeline incidents is reduced
- Alter or replace such practices so that the current level of consequences associated with pipeline incidents, should they occur, is reduced
- Alter or replace such practices with more cost-effective practices that achieve superior safety
- Continue current practices to maintain existing levels of risk.

The progression of a pipeline incident can also be used to guide and structure the identification of risk control options. As shown in Figure IV-4, prevention, mitigation, and response actions can be defined at various points in the incident progression.
Figure IV-4 Risk Control Activities During Progression of a Pipeline Incident

- Impact

- Accidental Event

- Cause

- Hazard

- Response
  - Evacuation
  - Spill response
  - Flowpath diversion

- Mitigation
  - Isolation Valves
  - Dike / trench
  - Sprinkler / deluge

- Prevention
  - Corrosion Control
  - Maintenance Programs
  - Impact Barriers

Example Types of Risk Control Activities
IV.2.2.1 Prevention Options

Risk management programs shall include a structured approach to identify and document possible actions to reduce the current likelihood of pipeline incidents or to prevent pipeline incidents in a more cost-effective manner. Possible actions to be investigated include, but are not limited to:

- Enhancements to pipeline design
- Physical modifications to the pipeline system hardware and configuration
- Changes in operational practices, including changes to the allowable operating conditions
- Changes in maintenance practices, including the nature and frequency of maintenance and inspections
- Improved qualifications of personnel
- Changes in the way that pipeline workers, third parties, and the public are notified of safety related conditions and existing pipeline risks.

IV.2.2.2 Mitigation and Response Options

Risk management programs shall include a structured approach to identify and document possible actions to diminish the size of the release and reduce the currently anticipated level of consequences should a pipeline incident occur, or to perform existing protection and mitigation activities in a more cost-effective manner. The possible actions to be investigated include, but are not limited to:

- Physical modifications to the pipeline system hardware and configuration that limit or reduce the release from a pipeline in the case of an incident
- Improvements in operational practices, including changes to the allowable operating conditions that serve to limit or reduce the release from a pipeline in the case of an incident
- Improvements to qualifications of personnel and the way that pipeline operators and other personnel are trained to respond to incidents
- Improvements in emergency response plans, equipment, and facilities
- Actions to limit the proximity of the public to pipelines
• Actions to limit the potential for environmental damage caused by release from the pipeline

• Improvements in the way that pipeline employees and contractors, third parties, and the public are notified of safety related conditions and existing pipeline risks

• Improvements in the way the pipeline is monitored and inspected (e.g., leak detection, surveillance, patrolling, etc.).

IV.2.2.3 Integration of Risk Control Options

Risk management programs shall include processes to produce an integrated set of potential risk control options, examining the possible conflicts and synergies between and among the individual risk control options identified above.

These integrative processes shall include an examination of the residual risk expected to remain after the identified risk control options have been implemented. Risk management programs shall include processes by which the residual risks are examined to determine whether there are additional risk control activities that could further reduce risk cost effectively.

IV.2.3 Evaluation and Comparison of Risk Control Options

Risk management programs shall include a structured process for evaluating and comparing the relative risk reduction benefits and costs of the risk control options being considered. Results of this process should support corporate management decision making.

IV.2.3.1 Evaluation of Risk Control Options

Risk management programs shall include a structured process for evaluating the relative benefits and costs of the risk control options being considered. The evaluation process includes, but is not limited to, an examination of:

• The current risks to the public, employees and contractors, and the environment that may exist before the proposed risk control option is implemented

• The estimated risks to the public, employees and contractors, and the environment that may exist after the proposed risk control option is implemented

• The cost (or cost savings) of implementing the risk control option

• The potential impact, if any, on the operation or expected life of the pipeline.

The process shall describe the manner in which uncertainties in risk, cost, and other decision factors are addressed. The evaluation processes shall also include (1) an examination of the
residual risk expected to remain after the identified risk control options have been implemented and (2) the consideration of additional risk control activities to address these residual risks.

**IV.2.3.2 Comparison of Risk Control Options**

Risk management programs shall include a structured process for comparing the risk control options being considered. The comparison process shall consider the risk-reduction benefits, the implementation costs, and other relevant factors associated with each risk control option. The comparison process shall describe:

1. The factors being considered (e.g., risk reduction to the public, risk reduction to the environment, cost to implement, etc.)
2. The methodologies for combining these factors (e.g., expert judgment, focus groups, qualitative logic models, priority matrices, weighted benefit-cost ratios, etc.).

The methodologies used to combine benefits should be compatible with company values and shall ensure that the values of regulators and external stakeholders are appropriately considered.

**IV.2.4 Selection of Risk Control Options**

Risk management programs shall include a structured process by which management decides whether to take actions including, but not limited to:

- Implementing the activity in the short term
- Deferring implementation of the activity to a later time
- Performing a portion of the activity
- Deferring the activity for further development
- Rejecting the activity
- Implementing temporary, compensatory actions to limit risk while other options are being developed and considered.

Implementing the selected set of risk control actions on the pipeline system is intended to reduce risk to the public, employees and contractors, and the environment compared to the existing conditions.

IV-14 January 17, 1997
IV.3 Performance Monitoring and Feedback

In the risk management process elements discussed in the preceding sections, current risks are assessed and a set of risk control activities are selected to control these risks. Performance Monitoring and Feedback provides a basis for measuring the effectiveness both of specific risk-control decisions and the entire risk management program, and to identify improvement opportunities.

A company's risk management program shall include a performance monitoring process that defines the performance measures selected, the manner and frequency in which data will be collected and the evaluation of performance against expected outcomes. In addition, the performance monitoring process shall evaluate the effectiveness of the specific program and process elements, and address appropriate improvements.

Performance monitoring and feedback addresses the following questions:

What improvements are expected from the risk control decisions? (Section IV.3.1)

What measures best capture these expected outcomes? (Section IV.3.1)

Are the selected risk control activities having the intended effects? (Section IV.3.2)

How can the overall risk management process be improved? (Section IV.3.3)

The performance monitoring and feedback process element, and its relationship to the other risk management process elements is illustrated in Figure IV-5.

Operators that participate in the Risk Management Demonstration Program shall provide performance measures that are specific to their demonstration project. In addition, they shall provide other program-wide performance measures that have been identified to enable OPS to assess the effectiveness of risk management as a potential regulatory alternative and enhance communication to stakeholders during the demonstration program.

In the Guidance on Performance Measures document, the following types of performance measures were defined:

1. Project-Specific: Project-specific measures quantify performance of a subset of a pipeline system specific to a risk management demonstration project. Project-specific performance measures would be monitored by the operator and used internally to allocate resources. They also would be used by the regulator to audit company performance in the demonstration project and ensure that superior safety and environmental protection are being achieved.
Figure IV-5
The Performance Monitoring & Feedback Process Element

Risk Assessment
Estimate the frequency and consequences of potential incidents
(Section IV.1)

Risk Control & Decision Support
Select activities to reduce risk or produce superior safety more efficiently
(Section IV.2)

Performance Monitoring & Feedback
Determine if the risk control decisions produce the anticipated outcomes
(Section IV.3)

Selection of Performance Measures
Identify expected outcomes of risk control decisions and associated metrics
(Section IV.3.1)

Monitoring & Evaluation of Performance
Track actual performance and compare with expectations
(Section IV.3.2)

Modifications to the Program
Analyze implications of observed performance to the models, data, assumptions, and conclusions of the risk management program
(Section IV.3.3)
Selection of these project-specific performance measures will depend on the expected outcomes of the risk management program, and should reflect the selected risk control activities. The analysis of pipeline incidents can also be used to guide and structure the identification of project-specific performance measures around intended improvements in the prevention of, mitigation of, or response to incidents.

Depending on the objectives of the operator's specific demonstration project, applicable measures of performance need to be established specific to the portion of the system under risk management. These measures are proposed by the operator during the application process and approved by the regulator prior to acceptance into the Risk Management Demonstration Program.

2. Program-Wide: Program-wide measures would consist of information that each operator entering the Risk Management Demonstration Program would agree to provide, regardless of the scope of their proposed demonstration project. This information will provide a common basis for the overall assessment of the success of the demonstration program by capturing the anticipated benefits and unintended or unexpected outcomes.

The program-wide performance measures are intended to provide for an aggregate representation of all participants in the Risk Management Demonstration Program measured against the risk management objectives. These measures would be common to all participants, supplemented by measures through the periodic surveying of regulators, operators, and other stakeholders.

**IV.3.1 Selection of Performance Measures**

Applicable measures of performance shall be established and specified for the portion of the operator's pipeline system under risk management. Selection of performance measures will depend on the expected outcomes of the company's risk management program, and shall reflect the selected risk control activities. The progression of a pipeline incident can also be used to guide and structure the identification of performance measures. As shown in Figure IV-6, performance measures can be structured around intended improvements in the prevention, mitigation, or response to incidents.
Figure IV-6  Performance Measures Associated with Stages of a Pipeline Incident

- Impact
- Accidental Event
- Cause
- Hazard

- Response
  - Effectiveness of Emergency Drills

- Mitigation
  - Reliability of Isolation Valves

- Prevention
  - Hydrotest Results
  - Example Performance Measures
At a minimum, local, project-specific performance measures shall meet the following criteria:

- Support the intent of the risk management initiative in achieving superior overall safety
- Are relevant to the risk control decisions being made in each proposed application, and track their short-term and long-term effectiveness
- Document starting conditions, either through historical data, current physical data, new test data, or comparison with similar segments
- Establish expected outcomes from risk-control decisions in the form of discrete values or ranges for each measure
- Enable auditing, monitoring, and documentation of performance.

Additional criteria that might be considered in the selection of the performance measures include:

- Data uniformity
- Cost of data collection
- Reliability of the measure
- Consistency of interpretation
- Ability to quantify.

Risk-related measures that could be considered include:

- Frequency and severity of incidents that lead to release of product
- Likelihood/number of casualties per release
- Number of customers or end-users affected per release incident
- Extent of environmental damage per release incident
- Economic cost of lost delivery per release incident
- Precursor or “anticipative” event measures
- Other measures specific to the risk control decisions.

Both direct and indirect performance measures are appropriate. Some performance measures provide direct measures of safety. Examples may include incident rates, volume of spills/releases, decrease in corrosion defects over time, and cathodic protection level. Other performance measures provide indirect measures from which safety can be inferred. Examples may include changes in pipeline mass balance (indicating undetected loss of product), right-of-way surveillance (indicating unauthorized activity that might lead to an increase in third-party damage events), customer satisfaction surveys (indicating declining reliability of service), etc.
One of the challenges in selecting direct performance measures for pipelines is that incidents are relatively infrequent. Performance monitoring with traditional event measures (such as reportable incidents) may not identify statistically significant trends. Therefore, risk management programs shall identify precursor or anticipative performance measures that indicate activities or events affecting pipeline integrity with the potential to cause a release of product.

IV.3.2 Monitoring and Evaluating Performance

The performance monitoring process shall define the mechanisms that will be used to collect information on a predetermined basis; monitor pipeline operating conditions, operating parameters, and physical condition; and track performance against the selected performance measures.

Success of a risk management program can be evaluated by comparing performance with expected outcomes established in the plan. By appropriate selection of performance measures, this can apply to the evaluation of individual risk control decisions as well as to the overall evaluation of the risk management program. The risk management program should identify appropriate time frames that would be required to allow statistically significant trends to become evident; for the company’s demonstration project, this may exceed the life of the Risk Management Demonstration Program.

Performance shortfalls can be identified based on differences between actual performance and the expected outcome. In those cases, it may be necessary to acquire additional data to confirm the shortfall, or make adjustments to the risk management program.

IV.3.3 Modifications to the Risk Management Program

The performance monitoring process shall establish criteria indicating when adjustments to risk-control decisions within the risk management program can be made, or adjustments to the risk management program itself are required. The criteria should indicate whether regulator notification and/or approval would be required. These criteria might include percentage deviation from the expected outcome, data quality, time frame, and impact of not making the adjustments (for example, would the problem self-correct?). The risk management program also should define the range of expected adjustments. Where possible, to avoid bias, these criteria shall be established before a performance variance or deficiency is encountered.
V. Conclusions

The application of risk management to pipeline operations offers potential benefits to consumers, operating companies, the general public, and the regulatory community. Implementing the program and process elements in accordance with this standard, is expected to achieve superior safety, environmental protection, and reliability levels. An effective risk management program, developed in conformance with this standard, can improve communication with regulators and other stakeholders about risks and risk control priorities. Industry and regulators believe risk management offers these benefits, and the Pipeline Risk Management Demonstration Program will test and verify this belief.
Appendix A

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Guidance on Performance Measures
for the
Risk Management Demonstration Program

Prepared by the
Joint Performance Measures Workgroup

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DRAFT
December 9, 1996
# TABLE OF CONTENTS

Executive Summary  (to be developed) ........................................ Page 3

I. Introduction ........................................................................ Page 4

II. Development of Risk Management Performance Measures ........ Page 6

   A. The Need for Performance Measures ................................. Page 6
   B. The Risk Management Shift ............................................. Page 6
   C. Performance Measurement Objectives ................................. Page 9

III. Identification of Performance Measures ............................... Page 12

   A. Types of Performance Measures ...................................... Page 12
   B. Project-Specific Measures ............................................. Page 13
   C. Program-Wide Measures .............................................. Page 14
   D. Nature and Availability of Program-Wide Performance Measures Page 20

IV. Implementation .................................................................. Page 21

   A. Performance Measures - Next Steps ............................... Page 21
   B. Integration with Formal Application ................................. Page 21
   C. Monitoring and Feedback Requirements ............................ Page 23

APPENDIX A: Survey Toolkit .................................................. A-1

APPENDIX B: Performance Measures Workgroup Membership .... B-1

FIGURES:  Figure 1: The Risk Management Shift ........................ Page 8
          Figure 2: Risk Management Implementation Process .......... Page 22

TABLES:  Table I: Safety and Reliability ................................ Page 16
          Table II: Resource Effectiveness .................................. Page 18
          Table III: Communication and Partnership ..................... Page 20

2 December 9, 1996
EXECUTIVE SUMMARY

TO BE DEVELOPED AFTER COMMENTS ARE RECEIVED AND REVIEWED; AFTER JANUARY 1997.
I. INTRODUCTION

The overall program structure for risk management includes\(^1\,\,2\):  

1) A regulatory framework\(^3\) that defines how the Office of Pipeline Safety (OPS) will accept, review, approve, and monitor proposed industry risk management demonstration projects;  

2) A program standard\(^4\) that describes the essential elements and necessary characteristics of an operator’s risk management program; and  

3) Performance measures that will be used to monitor individual demonstration projects and to enable OPS to determine the effectiveness of risk management as a regulatory alternative.  

This document addresses item 3) -- performance measures -- and provides guidance on the types of performance measures needed to substantiate:  

1. The acceptability of individual demonstration projects ("Project-specific measures"); and  

2. The benefits of risk management as a regulatory alternative ("Program-wide measures").  

The legislative\(^5\) language relating to performance measures reads:  

"Demonstrate, through the voluntary participation by owners and operators of gas pipeline facilities and hazardous liquid pipeline facilities, the application of risk management; and to evaluate the safety and cost effectiveness of the program."  
[Emphasis added.]  

As an additional condition of approval, the law requires that a risk management plan submitted to OPS contain measures that are designed to achieve equivalent or greater  

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safety than would otherwise be achieved through compliance with the current standards. The law also requires a report to Congress on the results of the demonstration projects, including the results of each individual project and an overall recommendation on the application of risk management in the Federal pipeline safety program.

This document provides guidance for this performance measurement, both to operators who are planning to participate in the Risk Management Demonstration Program and to those who must establish the safety and cost effectiveness of the overall program. Accordingly, this document must address two aspects of performance measures. The first is to assist operators in the development of a performance monitoring process for their demonstration project. Second, participants in the demonstration program will need to provide information that will be used to assess the overall effectiveness of risk management as a potential regulatory alternative.

Improved accountability to all pipeline stakeholders, commitment to continuous program improvement, and the need for flexibility are key concepts in the risk management process. The guidance that follows was developed based on these concepts. As a result, the recommendations on performance measures in this document should be considered by demonstration program participants as the starting point for the evaluation process. As experience is gained, it is expected that significant lessons will emerge that will result in improvement in all elements of the risk management program, including refinements and enhancements of the performance measures. It is fully expected that some measures may be dropped, some added, and some modified as performance measures are refined, but the extent and type of information collection described herein must be sufficient to allow program evaluation.
II. DEVELOPMENT OF PERFORMANCE MEASURES

A. THE NEED FOR PERFORMANCE MEASUREMENT

Performance measurement for any endeavor focuses the attention of all participants on the desired results of the process\(^6\). For the Risk Management Demonstration Program, some of the performance measures need to demonstrate that superior safety and environmental protection are achieved through this alternative means of government oversight of the industry. Performance measures are also needed to demonstrate that other expected benefits occur as well; namely, increased efficiency, improved communications, and a closer working government/industry relationship. Performance measures may also lead to the recognition of unintended or unexpected outcomes which should also be documented.

A number of federal agencies have applied risk management in various regulatory programs\(^7\). These agencies are attempting to measure the value and effectiveness of their risk management-based regulatory programs, with varying degrees of success. Building on the experience gained by these other agencies, as well as those of other countries, this document serves as a first step in developing pipeline-specific measures to track and document the actual improvements achieved through risk management.

B. THE RISK MANAGEMENT SHIFT

America's pipeline network is subject to dynamic and diverse conditions, traversing some 400,000 miles across the United States, encountering a broad range of operating environments and land uses. The current pipeline safety regulations attempt to address this range of conditions with homogeneous requirements which are not always sensitive to the diversity of issues actually faced by each different pipeline segment. Risk management provides the potential to improve the identification of the actual risks in a specific segment and support the development of more targeted risk-control measures. There is a concern that it will be difficult for OPS to regulate in this environment, owing to the increased flexibility. Therefore, the Demonstration Program will evaluate risk management as a regulatory alternative, and performance measures are needed to support this evaluation. Selection of appropriate performance measures is aided by considering what is desired from risk management. The following explanation of the


expected risk management “shift” should help the reader focus on the tangible benefits which can be counted, rated, or otherwise measured in a meaningful way.

The overlapping circles of Figure 1 represent how risk management can improve the identification of risks to the pipeline and allow more effective risk-control measures to be used. In the top pair of overlapping circles, the right circle represents the risks addressed in current regulations, while the left circle represents the real risks associated with a given pipeline at a particular location. At various points along the pipeline, the degree of overlap will vary depending on how closely the actual risks are represented by the premises on which the regulations were based. In general, the degree of overlap is reasonably good, however, in many cases the regulations may not address all the actual risks that are unique to a given location. Alternatively, they may address risks that - for this location and situation - are insignificant or for which the consequences are relatively low. Risk management seeks to increase the degree of overlap for these circles throughout the entire pipeline system.

The lower pair of overlapping circles is a representation of how risk management results in the application of more effective risk control activities throughout the entire system, as represented by an increase in the degree of overlap. Again, the existing degree of overlap is reasonably good, resulting in today’s safety record. However, in some cases the regulations specify activities to control risks that do not exist in certain locations, or that are not the most effective at controlling the risks that do exist. Yet, in other cases, regulations may not address risks that are very real. Risk management seeks to address these situations. This would result in improved risk control decisions, which would be represented by increased overlap between the risk control circles.
FIGURE 1

The Risk Management Shift

Identifying Risks

Risk not addressed

Risks Effectively Addressed

Real Risks to Pipeline

Risk Assessment

Risks Addressed in Regulations

Risk Management

Controlling Risks

Site/Situation Risk Controls

Ineffective Risk Control
Risk management also can be a vehicle through which agency and industry partnership can improve. The Risk Management Regulatory Framework which has been developed creates a mechanism to encourage meaningful and revealing dialog among regulators, stakeholders, and pipeline operators. During both the risk assessment and project review and monitoring process, risk management allows a useful exchange of information that enhances mutual understanding of both risks and risk control activities, resulting in communication and partnership benefits. To the extent that all parties understand how risk arises and how it can best be controlled, more effective risk controls can be identified and more rapidly implemented than may be possible with the current waiver or rulemaking processes.

Performance measures are needed as part of the Risk Management Demonstration Program to evaluate whether risk management effectively produces each of these types of improvements.

C. PERFORMANCE MEASUREMENT OBJECTIVES

For performance measures to be effective, they must establish whether this risk management shift occurs. This must be done both in terms of the handling of pipeline risks and ensuring effective dialog among stakeholders. This shift will be subtle, owing to the relative effectiveness of the current set of regulations. However, it should be evident, given a sufficient period of measurement. Performance measures for the demonstration program which address the following questions should establish whether this “shift” occurs.

1) Does risk management result in a greater safety, environmental protection, and service reliability than would otherwise be achieved through compliance with safety regulations?\textsuperscript{8}

At the demonstration project level, the integrity of the pipeline or pipeline segment must not be compromised compared with the effect of the current regulations. In the application, the operator will describe local, project-specific performance measures that must be accepted by the regulator. Regulators will review these applications to ensure that safety is not compromised and that adequate project-specific performance measures will exist. If an operator’s proposal is accepted, regulators will audit the project’s actual performance throughout the demonstration period, comparing actual results to targets and prompting action when results stray from these targets.

At the demonstration program level, performance measures must establish that risks are better understood, and that the spectrum of site- and situation-specific risks have been identified. In addition, there must be evidence that the catastrophic (high consequence,

but low probability) events are being addressed through risk management. And lastly, complaints lodged with OPS and service interruptions for pipeline customers are indicators of the effectiveness of risk management as it relates to service reliability.

Measures that help answer these questions are obtainable from incident data, assessments of risk awareness, and a history of service interruptions. In addition, changes in local, project-specific performance measures will help to assess the actual safety level of each project.

2) Are resources being better prioritized and more effectively applied under risk management?9

Operators will use risk assessment methodologies to identify the risks that face their pipelines and will seek to substitute more effective activities or approaches for segments in the project. In addition, where real risks are not identified by current regulations, operators will seek to address them with new activities or with innovative approaches. New technologies or equipment may be applied as operators seek to optimize their use of resources. And finally, as operators seek to extend the benefits of risk management, risk management will be applied to a greater degree among operators and within companies.

The effective use of regulatory resources and practices must also be considered when discussing risk management benefits. The effort expended to monitor or audit an operator must be considered, and balanced against the additional insight gained and efficiencies achieved over time as risk management is more widely deployed. In addition, the efforts of the regulator which are shifted away from the development of universally applied regulations to the more effective discussion of real risks and involvement in the decision making process need to be captured.

Performance measures that could help answer this question include surveys to determine the extent of the operator’s use of risk management; the degree of conformance of the operator’s program to the Risk Management Program Standard; the degree to which risk management practices are used inside and outside of the demonstration projects; and the degree of technological and process innovation resulting from flexibility granted in the demonstration projects. Surveys of regulators could assess improvements in effectiveness and efficiency of operator oversight.

3) Has agency and industry involvement in the discussion of risks and risk control options, and the agency and industry’s ability to impact desired outcomes, increased under risk management?10


During the project approval process, regulators will discuss operator’s risk assessment and risk management processes pertinent to the application. Throughout the demonstration period, regulators will evaluate performance data specific to the project. Through the review, approval, and monitoring process, opportunities will exist for a meaningful and mutually useful exchange of information, insights, and experiences, between the regulator and the operator and with other stakeholders as well. Operators will communicate with relevant authorities in order to better communicate hazards and potential consequences, and how they might more effectively be managed. Regulators will approach operators with issues they feel need to be addressed. Hazards, potential consequences, and risk control options will be discussed within the context of the operator’s chosen plan. To the extent that this dialog leads to improved mutual understanding and improved results, while also increasing the sense of partnership which occurs, risk management may be deemed successful as a communications tool.

*Performance measures to answer these questions can be obtained through surveys of both the government and industry participants.*
III. IDENTIFICATION OF PERFORMANCE MEASURES

This section provides guidance on the types of performance measures needed to substantiate both the acceptability of individual demonstration projects ("Project-Specific Measures") and the benefits of risk management as a regulatory alternative ("Program-Wide Measures").

A. TYPES OF PERFORMANCE MEASURES

In many cases, it will be difficult to unambiguously interpret trends in direct performance measures during the relatively short duration of the Demonstration Program. For example, an increase in the number of near-critical defects found over a period of four years may indicate that the risk of failure is increasing, perhaps as a result of steady degradation of the cathodic protection system. On the other hand, such an increase also could be the result of improvements in risk-based planning of inspections or targeting of certain portions of the system, or could reflect the easier introduction of new technologies expected under risk management. Therefore, performance measures for the Demonstration Program should also include indirect measures that, while less precise, should be capable of providing clearer trends over the course of the demonstration program.

Performance measures for safety and reliability will largely be directly obtained from outcome-based measures like property damage, and from precursors to potential incidents; for example, right-of-way encroachments.

Measures of resource effectiveness will include many indirect metrics, which contain imbedded assumptions. For example, the conclusion could be drawn that wide-spread use of risk management is one indication that risk management is an effective way to allocate resources, since operators will act in their own best business interests. Similarly, while particular measures will provide information about a company's risk management implementation, surveys may provide more general information about how risk management is being implemented by the pipeline industry. Specific examples will be recorded as well, to substantiate the results.

Measures based on incidents or releases are primarily suited to measurements on a large scale. Risk-related measures that could be considered on a large scale include:

- Frequency and severity of incidents that lead to release of product;
- Percentage or amount of spilled product recovered;
- Likelihood/number of casualties per release;
- Extent of environmental damage per release incident;
- Number of customers or end-users affected per release incident;
• Cost of lost delivery per release incident, including penalties; and
• Other measures specific to the risk control decisions.

On smaller scales, such as those anticipated for the portions of pipeline systems that would be involved in the Demonstration Program, the rarity of such events is a limitation on effective performance measurement. Therefore, other types of measures, such as precursors, may be needed for these smaller scale measurements.

Precursors are conditions which, if not corrected, could eventually lead to a failure, release or, at least, a service interruption. Examples of precursor events could include:

• Inoperable valves;
• Set point drift in pressure control devices;
• Abnormal cathodic protection readings;
• Encroachments on right of way; and
• Customer service difficulties.

Precursor data may be available from existing operating or maintenance records kept by the operator. This information can be used to establish the starting condition of the system, depending on the nature of the proposed demonstration project. However, in many cases, historical data will be inadequate, particularly in quantifying newly identified risks.

In addition to absolute values, trends in the data will be meaningful in assessing the effectiveness of risk management in each demonstration project. In developing project-specific performance measures, it is necessary to establish what magnitude of trend represents normal fluctuations versus significant deviations. For example, if the annual frequency of a specific event changes by 10%, does this indicate a significant performance shift, or is it within the normal range of event frequency variation? The performance measures should be able to recognize whether shifts or variances from previous precursor data are or are not significant. Both the magnitude and frequency of precursors should be considered as potential project-specific measures.

B. PROJECT-SPECIFIC MEASURES

Depending on the objectives of the operator’s specific demonstration project, applicable measures of performance need to be established and specified for the portion of the system under risk management. These measures are proposed by the operator during the application process and approved by the regulator prior to acceptance into the Risk Management Demonstration Program.
Selection of these project-specific performance measures will depend on the expected outcomes of the risk management program, and should reflect the selected risk control activities. The analysis of pipeline incidents can also be used to guide and structure the identification of project-specific performance measures around intended improvements in the prevention of, mitigation of, or response to incidents.

In the Risk Management Program Standard, the following base criteria were defined for local, project-specific measures:

- Support the intent of the risk management initiative in achieving equal or greater overall safety;

- Are relevant to the risk control decisions being made in each proposed application, and can track their short-term and long-term effectiveness;

- Document starting conditions, either through historical data, current physical data, new test data, or comparison with similar segments;

- Establish expected outcomes from risk-control decisions in the form of discrete values or ranges for each measure; and

- Enable auditing, monitoring, and documentation of performance.

Additional criteria that might be considered in the selection of performance measures include: the availability of data, the cost of data collection, perceived reliability of the measure, consistency of interpretation, and ability to quantify.

C. PROGRAM-WIDE MEASURES

Program-wide measures would consist of information that each operator entering the Risk Management Demonstration Program would agree to provide, regardless of the scope of their application. This information will provide a common basis for the overall assessment of the success of the Demonstration Program by capturing the anticipated benefits and unintended or unexpected outcomes.

The program-wide performance measures are intended to provide for an aggregate representation of all participants in the demonstration program measured against the risk management objectives. These measures would be common to all participants supplemented by measures through the periodic surveying of regulators, operators, and other stakeholders. Polls/surveys would be focused on information data collection and opinion monitoring. Compliance with demonstration project plans will be measured in the project audits.

---

Program-wide measures must address the following three areas.\textsuperscript{12}

1) \textbf{Safety and Reliability} - Does risk management result in greater safety, environmental protection, and service reliability than would otherwise be achieved through compliance with the safety regulations?

2) \textbf{Resource Effectiveness} - Are resources being better prioritized and more effectively applied under risk management?

3) \textbf{Communication and Partnership} - Has agency and industry involvement in the discussion of risks and risk control options, and the agency and industry’s ability to impact desired outcomes, increased under risk management?

\textbf{Safety and Reliability}

"Safety," as used here, is the protection of the public, the environment, and property, and "risk" is a measure of threat to this protection. "Reliability" is the degree to which service to customers is free from disruptions, considering not only the frequency and duration of disruption but also its impact and significance. Measures fall into the following categories:

- \textbf{Incident Data} -- For example: Deaths, injuries, number of releases, amount of property damage, product released are types of incident data. These measures would be expected to decrease under risk management. However, because incidents are relatively rare and only a small portion of the nation-wide system will be included in the demonstration program, statistically significant trends are not expected to emerge within the four-year program. Incidents may occur within the Demonstration Program, and longer term trending may then be needed. It will be useful to review any incidents which do occur to assess ramifications related to risk assessment and risk control processes.

- \textbf{Risk Awareness} -- New and previously unrecognized hazards and consequences, along with an evaluation of their significance, including low-probability/high-consequence events. These measures would be expected to increase under risk management.

- \textbf{Public Customer Service} -- Complaints on safety or environmental issues which have been determined by OPS or State regulators to be valid. This measure would be expected to decrease under a risk management regulatory alternative since more meaningful dialog should be occurring between operators.

stakeholders, and regulators, resulting in a better appreciation of local concerns. Overall communication, whether positive or negative, is expected to increase.

- **Operator Customer Service** -- Significant interruptions caused by system upsets, lost production, product outages, curtailment of customer service, loss of service, or other disruptions. Planned service interruptions (e.g., maintenance) typically do not result in disruptive loss of service, and are not included in this measure. This measure would be expected to decrease under risk management.

<table>
<thead>
<tr>
<th>Table I - Safety and Reliability.</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Category</strong></td>
</tr>
<tr>
<td>Incident Data</td>
</tr>
<tr>
<td>Risk Awareness</td>
</tr>
<tr>
<td>Public Customer Service</td>
</tr>
<tr>
<td>Operator Customer Service</td>
</tr>
</tbody>
</table>

**Resource Effectiveness**

For operators, these measures will provide information on the degree of improvements made by operators in their use of company resources using risk management as a regulatory alternative within the demonstration program. For regulators, these measures will provide information on the degree to which the regulatory process has become more effective and efficient as a result of risk management considerations. The measures fall into the following categories:
• **Level of Participation** -- Number of demonstration participants (up to the maximum of ten), fraction of an operator's system in demonstration program, number of letters of intent, and survey of participants to determine whether they intend to use risk management again or to expand the scope of their present project. The first three measures would be expected to increase if the program is successful.

• **Operator Resources and Innovation** -- Number of new technologies and resulting waivers sought, alternate methodologies, innovative approaches, new risk control activities. These measures would be expected to increase if risk management is effective.

• **Regulator Resources and Innovation** -- Number of staff needed to monitor the program, number of inspection days, number of review/monitoring days, number of rulemakings where risk management considerations were an influencing factor. If the demonstration program is successful, the first three measures would be expected to decrease over the long term (after training is fully implemented and experience with risk management is gained), and the last measure (number of rulemakings) would be expected to increase.

---

Table II - Resource Effectiveness

<table>
<thead>
<tr>
<th>Category</th>
<th>Description</th>
<th>Information Source</th>
<th>Form</th>
<th>Expected Outcome</th>
</tr>
</thead>
<tbody>
<tr>
<td>Level of participation</td>
<td>Number of demonstration participants fraction of system in program, letters of intent Expanded scope of use of risk management</td>
<td>OPS program records</td>
<td>Number</td>
<td>Expected increase</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Participant survey</td>
<td>Yes/No</td>
<td></td>
</tr>
<tr>
<td>Operator Resources and Innovation</td>
<td>New Technologies, alternative methodologies, and innovative approaches to control risk</td>
<td>Participant survey</td>
<td>Number from survey</td>
<td>Expected increase</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Number of waivers for broader use beyond the projects</td>
<td></td>
</tr>
<tr>
<td>Regulator Resources and Innovation</td>
<td>Staff inspection reports</td>
<td>Survey</td>
<td>Number</td>
<td>Decrease; initial increase due to inspector learning curve</td>
</tr>
<tr>
<td></td>
<td>Risk-Based rulemakings</td>
<td>Survey</td>
<td>Number plus narrative of examples</td>
<td>Increase</td>
</tr>
</tbody>
</table>

Communication and Partnership

These measures will address communication among regulators, operators, and other stakeholders to determine risk management’s effectiveness in promoting mutual understanding of, and involvement in the identification of risks and risk control activities. The measures also will address the degree of partnering that develops between regulators and operators as a result of the negotiating and monitoring process associated with the approval and implementation of each company’s demonstration project. These measures fall into the following categories:

- **Mutual Understanding of Risks** -- Parallel surveys of regulators and operators on their understanding of hazards, consequences, and risk control activities. The degree of understanding should increase if risk management is an effective regulatory alternative, and the degree of agreement between the two sets of surveys should improve.
• **Communication** -- Parallel surveys of regulators and operators to address access, openness, and perceived flexibility. These measures should improve if risk management leads to a better understanding of hazards and risk control activities.

• **Stakeholder Involvement** -- Number of outside parties, authorities, and agencies who become involved in the risk management process in order to add to and share in the understanding of risks and risk control activities.
Table III - Communications and Partnership

<table>
<thead>
<tr>
<th>Category</th>
<th>Description</th>
<th>Information Source</th>
<th>Form</th>
<th>Expected Outcome</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mutual understanding of risks</td>
<td>Understanding of hazards, consequences, and risk-control activities</td>
<td>Parallel surveys of operators and regulators and other stakeholders</td>
<td>Scale with narrative examples</td>
<td>Increase or improve</td>
</tr>
<tr>
<td>Communications</td>
<td>Access, openness, and perceived flexibility</td>
<td>Parallel surveys of operators and regulators and other stakeholders</td>
<td>Scale with narrative examples</td>
<td>Increase or improve</td>
</tr>
<tr>
<td>Stake-holder involvement</td>
<td>Number of outside parties, authorities, and agencies involved in the process</td>
<td>Operator survey</td>
<td>Scale with narrative examples</td>
<td>Increase or improve</td>
</tr>
</tbody>
</table>

D. NATURE AND AVAILABILITY OF PROGRAM-WIDE PERFORMANCE MEASURES

Many of the performance measures described above are already captured in a variety of reports to regulators. However, they are not collected in a manner that can easily be used to support evaluation of the success of the demonstration program. Some of the recommended measures are new. This newly collected information will seek to address many questions which are not asked currently. Some measures are direct and quantitative, others by necessity are indirect and subjective.
IV. IMPLEMENTATION

A. PERFORMANCE MEASURES - NEXT STEPS

The performance measures defined in this report are expected to provide the information needed by OPS to prepare a Report to Congress describing the results of the demonstration program, including the effects of each individual project and an overall recommendation on the application of risk management. This guidance document is intended to provide participants in the risk management demonstration project with an initial set of measures to be incorporated into each of their project plans. Because part of the process is to define and gather valid metrics, it is expected that these performance measures will be refined and modified as experience is gained from the approved risk management demonstration projects.

To support the validation of the measures and to provide guidance to companies considering risk management, OPS and operators participating in demonstration projects will prepare interim annual progress reports. These reports would describe the adequacy of the current set of measures, specific examples of risk control activities and their outcomes, and thereby become an evolving measure of the effectiveness of risk management. This report will be provided to the Joint Risk Assessment Quality Team members for their consideration in refining and evaluating the overall risk management program.

B. INTEGRATION WITH FORMAL APPLICATION

The process that must be followed to participate in the Risk Management Demonstration Program is described in the regulatory framework which defines how OPS will accept, review, approve, and monitor proposed industry risk management projects. One element of this process will be the submittal of a Formal Application. This application will be reviewed by the Project Review Team (PRT). As shown in Figure 2, a description of the process that a company plans on following to establish performance measures must be incorporated into each company's Formal Application. This process should document the development of initial safety, reliability, resource effectiveness, communication, and partnership measures specific to the application. The formal application would also include a commitment to provide the program-wide performance measures stated in this report or a modification of these measures.
FIGURE 2

Risk Management Implementation Process

Office of Pipeline Safety

Letter of Intent

Consultation

Project Review Team

Formal Application and Approval
- Risk Profile
- Project-Specific Measures

Implementation
- Operator Audits
- Program-Wide Measures
- Review and Recalibration

Program Evaluation Team - To be developed

OPS Inputs:
1. Brief system profile
2. Past safety and compliance records

Company Inputs:
1. Scope of risk management demonstration
2. Description of alternative safety practices
3. Compliance with Risk Management Program Standard
4. Company risk management principles

Company Inputs:
1. Demonstrated support of objectives of risk management demonstration
2. Demonstrated integration of risk management with company operating policies
3. Inclusion of risk assessment process
4. Inclusion of risk control and decision-support process
5. Inclusion of performance measurement and feedback process
6. Inclusion of work plan, company monitoring and regulator audit plan
7. Scope of risk management demonstration
8. Description of alternative safety practices
9. Compliance with Risk Management Program Standard
This performance measurement and feedback process must integrate some of the following considerations:

- The scope of audits corresponds to the extent of performance measurement and should reflect resources required for demonstration;
- Enhanced understanding of systems due to additional data;
- The changes in the risk profile of the pipeline, before and after the project; and
- Understanding the current level of safety.

C. MONITORING AND FEEDBACK REQUIREMENTS

To determine, report, and improve the effectiveness of the overall risk management program, a risk management demonstration project proposal shall include a planned and structured evaluation of its activities and processes. The proposal will also describe appropriate feedback mechanisms. The annual evaluation thus serves as a quality or continuous improvement element of the risk management program. In keeping with the Interim Risk Management Program Standard, and the performance measurement guidelines contained within this document, the operator must identify project-specific performance measures that demonstrate the effectiveness of the risk-control decisions being made. During the plan approval process, OPS will determine whether these project-specific performance measures appear appropriate and adequate. Throughout a demonstration project, the operator will measure performance to ensure that safety is being maintained or improved, and to ensure that the performance measures remain appropriate and adequate. The operator would describe these project-specific performance measures to OPS; and where appropriate, support the refinements of these measures based upon the evolving experience base.

The risk management proposals shall include an evaluation plan that periodically examines and reports:

- The quality and effectiveness of the administrative, communication, and documentation program elements;
- The quality and effectiveness of the analytical and management processes used to assess risks, identify possible ways to control these risks, and allocate resources to control risks in the most cost-effective way and monitor performance; and
- The quality and effectiveness of the performance measures and assessment of their impacts on risk management decisions.
APPENDIX A

SURVEY TOOLKIT

The following were developed as guidance for initial survey items for pipeline operators, government regulators, and other stakeholders for the Risk Management Demonstration Program. As experience is gained in the program, it is expected that survey items will be refined and otherwise improved. The items are divided into tables organized by target audience.

Codes used in the "Form of Response" column

- Scale = Scale response (example: 1 = very poor, 3 = neutral, 5 = Very good)
- Number = Actual number (i.e., a count or quantity)
- Narrative = A statement or short answer response

It is anticipated that professional surveys using demonstrated surveying techniques would be designed when surveys are undertaken. The JRAQT recognizes that conducting unbiased surveys is crucial to building trust and in the evaluation of risk management as a potential regulatory alternative.

December 9, 1996
<table>
<thead>
<tr>
<th>Question</th>
<th>Form of Response</th>
<th>Evaluation Category</th>
</tr>
</thead>
<tbody>
<tr>
<td>Has the risk management demonstration project been beneficial in terms of improving the relationship among operators, regulators, and stakeholders?</td>
<td>Yes / No</td>
<td>Communications and Partnership (Communications)</td>
</tr>
<tr>
<td>As a result of the risk management demonstration project has communications among operators, regulators, and stakeholders improved?</td>
<td>Yes / No</td>
<td>Communications and Partnership (Communications)</td>
</tr>
<tr>
<td>Compared to before the risk management demonstration project, to what degree are stakeholders involved in discussions of pipeline hazards and consequences?</td>
<td>Scale:</td>
<td>Communications and Partnership (Stakeholder Involvement)</td>
</tr>
<tr>
<td></td>
<td>1 - Much less than before</td>
<td></td>
</tr>
<tr>
<td></td>
<td>3 - About the same as before</td>
<td></td>
</tr>
<tr>
<td></td>
<td>5 - Much more than before</td>
<td></td>
</tr>
<tr>
<td>How has stakeholder involvement attributed to the risk management demonstration project increased their ability to contribute to risk control (for example, land-use decisions)?</td>
<td>Scale:</td>
<td>Communications and Partnership (Stakeholder Involvement)</td>
</tr>
<tr>
<td></td>
<td>1 - Inconsequential</td>
<td></td>
</tr>
<tr>
<td></td>
<td>3 - Some contributions</td>
<td></td>
</tr>
<tr>
<td></td>
<td>5 - Significant contribution</td>
<td></td>
</tr>
</tbody>
</table>

* Please provide some examples of how this has helped.
<table>
<thead>
<tr>
<th>Question</th>
<th>Form of Response</th>
<th>Evaluation Criteria</th>
</tr>
</thead>
<tbody>
<tr>
<td>As a result of the risk management demonstration project:</td>
<td>Yes / No</td>
<td>Communications and Partnership (Mutual Understanding of Risk)</td>
</tr>
<tr>
<td>Do you have a better understanding of regulator and stakeholder concerns?</td>
<td>Scale:</td>
<td></td>
</tr>
</tbody>
</table>
| • If yes, to what degree has your understanding of these concerns improved? | 1- Very marginal improvement  
2- Nominal improvement  
3- Substantial improvement |                                                         |
| To what degree has improved understanding of the risks in the demonstration segment led to increased flexibility by regulators in considering alternative approaches? | Scale:           | Communications and Partnership (Communication) |
|                                                                         | 1- Rigid         |                                                         |
|                                                                         | 2- Somewhat flexible |                                      |
|                                                                         | 3- Very flexible  |                                                         |
| To what degree has improved understanding of the risks led to increased involvement by the regulator in risk-control decisions? | Scale:           | Communications and Partnership (Mutual Understanding of Risk) |
| • Has this involvement been constructive?                             | 1- No change in regulator involvement  
2- Moderate improvement in involvement  
3- Much greater involvement |                                                         |
<p>| • Please provide some examples.                                       | Yes / No         |                                                         |
|                                                                         | Narrative        |                                                         |
| Exclusive of your risk management demonstration segment, does your company base its operations an maintenance decisions of a formal risk management program corporate-wide? | Yes / No         | Resource Effectiveness (Level of Participation) |</p>
<table>
<thead>
<tr>
<th>Question</th>
<th>Form of Response</th>
<th>Evaluation Criteria</th>
</tr>
</thead>
<tbody>
<tr>
<td>Approximately what percent of the integrity-related budget operates under the risk management demonstration project.</td>
<td>Scale: 0 - 5% 5 - 15% 15 - 30% 30 - 60% 60 - 100%</td>
<td>Resource Effectiveness (Level of Participation)</td>
</tr>
<tr>
<td>To what extent is the segment of pipe in the demonstration project representative of your entire system? (i.e., have similar risks to integrity)</td>
<td>Scale: 1- Unique segment; unrepresentative of risks to the rest of the system  3- Most of the system has risk similar to the demonstration segment with some exceptions 5- Same risks seen throughout the system with only minor exceptions</td>
<td>Resource Effectiveness (Level of Participation)</td>
</tr>
<tr>
<td>To what extent does your company's use of risk management address the process elements in the Proposed Program Standard?</td>
<td>Scale: 1- Rely on regulations to identify and assess risks  3- Rely on regulations and selected review of hazards for risk assessment  5- Comprehensive risk assessment with all hazards considered.</td>
<td>Resource Effectiveness (Level of Participation)</td>
</tr>
<tr>
<td>Do you anticipate including more of your pipeline system in the demonstration project?</td>
<td>Yes / No</td>
<td>Resource Effectiveness (Level of Participation)</td>
</tr>
</tbody>
</table>
| Have you learned any lessons in the demonstration segment that you would want to apply to other parts of your pipeline? • If so, would they require additional OPS action • Please describe a few significant examples. | Yes / No  
Narrative                                                                 | Resource Effectiveness (Level of Participation) |
Table A-2 Survey Question Directed to Operators Participating in the Demonstration Project. (Continued)

<table>
<thead>
<tr>
<th>Question</th>
<th>Form of Response</th>
<th>Evaluation Criteria</th>
</tr>
</thead>
</table>
| Are there any new hazards which you have identified as a result of risk management?  
  • If so, to what degree of importance would you assign those newly identified hazards?  
  • Please describe a few of the most significant.                           | Yes / No         | Safety and Reliability (Risk Awareness)   |
| Have you identified any new consequences or better defined consequences as a result of risk management?  
  • If so, to what degree of importance would you assign these newly identified or newly understood consequences  
  • Describe a few of the most significant.                                  | Yes / No         | Safety and Reliability (Risk Awareness)   |
| As a result of Risk Management, are there any low probability/high consequence events you are addressing which you wouldn't have under existing regulations?  
  • If so, how many?  
  • Please describe them                                                      | Yes / No         | Safety and Reliability (Risk Awareness)   |
| Have you conducted a risk reassessment due to a change in pipeline operation, a change in external factors and/or hazards potentially impacting the pipeline, or due to additional knowledge or data which has been secured since initiating risk management?  
  • If so, how would you characterize the significance of these new findings?  
  • Please describe them                                                      | Yes / No         | Safety and Reliability (Risk Awareness)   |
<table>
<thead>
<tr>
<th>Question</th>
<th>Form of Response</th>
<th>Evaluation Criteria</th>
</tr>
</thead>
<tbody>
<tr>
<td>As a result of risk management, have any new risk control activities been initiated or equipment installed?</td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Describe a few of the most significant.</td>
<td>Yes / No</td>
<td>Resource Efficiency</td>
</tr>
<tr>
<td>• To what extent will these activities improve the safety performance and/or reliability of the pipeline?</td>
<td>Narrative</td>
<td>(Operator Resources and Innovation)</td>
</tr>
<tr>
<td>• To what extent will these activities result in improved allocation of resources?</td>
<td>Scale: 1- Not very much 3- To some extent 5- A lot</td>
<td>Resource Efficiency</td>
</tr>
<tr>
<td></td>
<td>Scale: 1- Not very much 3- To some extent 5- A lot</td>
<td>(Operator Resources and Innovation)</td>
</tr>
<tr>
<td>As a result of risk management, have any new technologies, or other innovative approaches been initiated in the demonstration project.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Please describe a few of the most significant.</td>
<td>Yes / No</td>
<td>Resource Efficiency</td>
</tr>
<tr>
<td>• To what extent will these activities improve the safety performance and/or reliability of the pipeline?</td>
<td>Narrative</td>
<td>(Operator Resources and Innovation)</td>
</tr>
<tr>
<td>• To what extent will these activities result in improved allocation of resources?</td>
<td>Scale: 1- Not very much 3- To some extent 5- A lot</td>
<td>Resource Efficiency</td>
</tr>
<tr>
<td></td>
<td>Scale: 1- Not very much 3- To some extent 5- A lot</td>
<td>(Operator Resources and Innovation)</td>
</tr>
<tr>
<td>Have any risk-control activities been identified which are ineffective and, as a result, are no longer performed?</td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Please describe a few of the most significant examples.</td>
<td>Yes / No</td>
<td>Resource Efficiency</td>
</tr>
<tr>
<td></td>
<td>Narrative</td>
<td>(Operator Resources and Innovation)</td>
</tr>
<tr>
<td>Question</td>
<td>Form of Response</td>
<td>Evaluation Criteria</td>
</tr>
<tr>
<td>-------------------------------------------------------------------------</td>
<td>----------------------------------------------------------------------------------</td>
<td>-------------------------------------------------------------</td>
</tr>
<tr>
<td>To what degree has regulator access to safety/risk-related information about pipeline segment in the demonstration project increased?</td>
<td>Scale:</td>
<td>Communications and Partnership (Communications)</td>
</tr>
<tr>
<td></td>
<td>1- No Change</td>
<td></td>
</tr>
<tr>
<td></td>
<td>3- Intermediate Change</td>
<td></td>
</tr>
<tr>
<td></td>
<td>5- Substantial Change</td>
<td></td>
</tr>
<tr>
<td>As a Result of the risk management demonstration project, how many local authorities or other stakeholders have you involved who would not have been involved otherwise?</td>
<td>Number (Count of local authorities and stakeholders)</td>
<td>Communications and Partnership (Stakeholder Involvement)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Please provide some examples with significant results.</td>
<td></td>
</tr>
<tr>
<td>Has a better understanding of probabilities and consequences associated with these hazards been achieved through increased communications due to the risk management demonstration project?</td>
<td>Yes / No</td>
<td>Communication and Partnership (Mutual Understanding of Risk)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>If so, please provide some examples of how this has helped.</td>
<td></td>
</tr>
<tr>
<td>How often has this improved understanding, due to the risk management demonstration project, led you to reconsider priorities in risks to address?</td>
<td>Scale:</td>
<td>Communication and Partnership (Mutual Understanding of Risk)</td>
</tr>
<tr>
<td></td>
<td>1- Never</td>
<td></td>
</tr>
<tr>
<td></td>
<td>3- A few times</td>
<td></td>
</tr>
<tr>
<td></td>
<td>5- Many concrete examples</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Please provide some significant examples.</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Table A-3 Survey Question Directed to Operators and Regulators Participating in the Risk Management Demonstration Project. (Continued)

<table>
<thead>
<tr>
<th>Question</th>
<th>Form of Response</th>
<th>Evaluation Criteria</th>
</tr>
</thead>
<tbody>
<tr>
<td>Has a better understanding of risk-control alternatives been achieved due to the risk management demonstration project?</td>
<td>Yes / No</td>
<td>Communication and Partnership (Mutual Understanding of Risk)</td>
</tr>
<tr>
<td>- To what factor(s) do you attribute this better understanding?</td>
<td>Narrative</td>
<td></td>
</tr>
<tr>
<td>- Please provide some significant examples.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>How often has improved understanding due to the risk management demonstration project led you to reconsider priorities in risk-control measures to implement?</td>
<td>Scale:</td>
<td>Communication and Partnership (Mutual Understanding of Risk)</td>
</tr>
<tr>
<td>- Please provide some significant examples.</td>
<td>Scale:</td>
<td></td>
</tr>
<tr>
<td></td>
<td>1- Never</td>
<td></td>
</tr>
<tr>
<td></td>
<td>3- Some</td>
<td></td>
</tr>
<tr>
<td></td>
<td>5- Many concrete examples</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Narrative</td>
<td></td>
</tr>
</tbody>
</table>

Table A-4 Survey Question Directed to Regulators and Stakeholders participating in the Risk Management Demonstration Project.

<table>
<thead>
<tr>
<th>Question</th>
<th>Form of Response</th>
<th>Evaluation Criteria</th>
</tr>
</thead>
<tbody>
<tr>
<td>As a result of the risk management demonstration project, do you feel you have a better understanding of the risks associated with the pipeline?</td>
<td>Yes / No</td>
<td>Communications and Partnership (Mutual Understanding of Risks)</td>
</tr>
<tr>
<td>- If so, to what degree has your understanding improved?</td>
<td>Scale:</td>
<td></td>
</tr>
<tr>
<td></td>
<td>1- Very marginal improvement</td>
<td></td>
</tr>
<tr>
<td></td>
<td>3- Nominal improvement</td>
<td></td>
</tr>
<tr>
<td></td>
<td>5- Substantial improvement</td>
<td></td>
</tr>
<tr>
<td>Do you feel you have a better understanding of the operator’s risk-control decisions?</td>
<td>Yes / No</td>
<td>Communications and Partnership (Mutual Understanding of Risks)</td>
</tr>
<tr>
<td>- If yes, to what degree has your understanding improved?</td>
<td>Scale:</td>
<td></td>
</tr>
<tr>
<td></td>
<td>1- Very marginal improvement</td>
<td></td>
</tr>
<tr>
<td></td>
<td>3- Nominal improvement</td>
<td></td>
</tr>
<tr>
<td></td>
<td>5- Substantial improvement</td>
<td></td>
</tr>
</tbody>
</table>
### Table A-5 Survey Questions Directed to the Office of Pipeline Safety.

<table>
<thead>
<tr>
<th>Question</th>
<th>Form of Response</th>
<th>Evaluation Criteria</th>
</tr>
</thead>
<tbody>
<tr>
<td>What are the total number of OPS inspection days for the following phases of the risk management demonstration project:</td>
<td>Number of person days</td>
<td>Resource Effectiveness (Regulatory Resource and Innovation)</td>
</tr>
<tr>
<td>• Application Review and Approvals</td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Renegotiation of Plans</td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Monitoring of Plans</td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Termination of Plans</td>
<td></td>
<td></td>
</tr>
<tr>
<td>How many new OPS actions* incorporated risk-based approaches.</td>
<td>Number of actions*</td>
<td>Resource Effectiveness (Regulatory Resource and Innovation)</td>
</tr>
<tr>
<td>• Please describe some significant examples.</td>
<td>Narrative</td>
<td></td>
</tr>
<tr>
<td>How many new OPS actions* reflect new or innovative approaches discovered during a demonstration project?</td>
<td>Number of actions*</td>
<td>Resource Effectiveness (Regulatory Resource and Innovation)</td>
</tr>
<tr>
<td>• Please describe some significant examples.</td>
<td>Narrative</td>
<td></td>
</tr>
<tr>
<td>How many OPS actions* would/could have been avoided because of risk management?</td>
<td>Number of actions*</td>
<td>Resource Effectiveness (Regulatory Resource and Innovation)</td>
</tr>
<tr>
<td>• Please describe some significant examples.</td>
<td>Narrative</td>
<td></td>
</tr>
</tbody>
</table>

* OPS actions could include rulemakings, compliance actions, waivers, or adjustment to standards. Specific examples are very important.

### Table A-6 Survey Questions Directed to the General Pipeline Industry.

<table>
<thead>
<tr>
<th>Question</th>
<th>Form of Response</th>
<th>Evaluation Criteria</th>
</tr>
</thead>
<tbody>
<tr>
<td>Does your company base its operations or maintenance decisions on formal risk management program corporate wide?</td>
<td>Yes / No</td>
<td>Resource Effectiveness (Level of Participation)</td>
</tr>
<tr>
<td>• If yes, in general, to what extent does your company use risk management to make O&amp;M decisions.</td>
<td>Scale: 1- Not at all 2- Not really 3- Partially 4- Mostly 5- Fully integrated</td>
<td></td>
</tr>
</tbody>
</table>
## APPENDIX B

### Performance Measures Workgroup Membership

<table>
<thead>
<tr>
<th>Name</th>
<th>Organization/Address</th>
<th>Phone, Fax</th>
<th>Email</th>
</tr>
</thead>
<tbody>
<tr>
<td>Boss, Terry</td>
<td>Interstate Natural Gas Assoc. of America, 555 13th St, W.S., STE 300 W, Washington, DC 20005</td>
<td>202-626-3224 Fax: 3249</td>
<td></td>
</tr>
<tr>
<td>Cialone, Henry</td>
<td>Battelle Memorial Institute, 505 King Avenue, Columbus, OH 43201</td>
<td>614-424-4271 Fax: 3013</td>
<td></td>
</tr>
<tr>
<td>Daugherty, Linda</td>
<td>U.S. DOT OPS, DPS-20, 407 7th St, SW, Washington, DC 20590-0001</td>
<td>202-366-4572 Fax: 4566</td>
<td></td>
</tr>
<tr>
<td>Drake, J.A. (Andy)</td>
<td>PanEnergy, 5444 Westheimer, Houston, TX 77056-5388</td>
<td>713-989-2311 Fax: 2102</td>
<td></td>
</tr>
<tr>
<td>Hansen, Bruce</td>
<td>U.S. DOT OPS, DPS-3, 400 7th St, SW, Washington, DC 20590-0001</td>
<td>202-366-8053 Fax: 4566</td>
<td><a href="mailto:HansenB@RSPA.DOT.GOV">HansenB@RSPA.DOT.GOV</a></td>
</tr>
<tr>
<td>Dusek, Phil J.</td>
<td>National Gas Pipeline Company, 701 E. 22nd Street, Lombard, IL 60148-5072</td>
<td>630-661-3424 Fax: 3027</td>
<td></td>
</tr>
<tr>
<td>Gerard, Stacey</td>
<td>U.S. DOT OPS, DPS-3, 400 7th St, SW, Washington, DC 20590-0001</td>
<td>202-366-6855 Fax: 4566</td>
<td></td>
</tr>
<tr>
<td>Hansen, Bruce</td>
<td>U.S. DOT OPS, DPS-3, 400 7th St, SW, Washington, DC 20590-0001</td>
<td>202-366-4576 Fax: 4566</td>
<td>Email: John.Hess@RSPA</td>
</tr>
<tr>
<td>Hottinger, James M.</td>
<td>Virginia State Corporation Commission, PO Box 1197, Richmond, VA 23218</td>
<td>804-371-9843 Fax: 9850</td>
<td></td>
</tr>
<tr>
<td>Huntoon, Ivan A.</td>
<td>U.S. DOT OPS Central Region, 1100 Main St, Room 1120, Kansas City, MO 64105</td>
<td>816-426-2654 Fax: 2598</td>
<td></td>
</tr>
<tr>
<td>Jetmairis, Anthony F.</td>
<td>Colorado Public Utilities Commission, 1580 Logan St, Room 340, Denver, CO 80203</td>
<td>303-894-2000 Fax: 2065 Extension x351</td>
<td></td>
</tr>
<tr>
<td>Matheson, Marty</td>
<td>American Petroleum Institute, 1220 L St, NW, Washington, DC 20005</td>
<td>202-682-8192 Fax: 8222</td>
<td></td>
</tr>
<tr>
<td>McDonough, Thomas</td>
<td>DOT/RSPA/Volpe Center, 55 Broadway, Kendall Square, Cambridge, MA 02142</td>
<td>617-494-2459 Fax: 3028</td>
<td>Email: <a href="mailto:mcdonough@volpe1.dot.gov">mcdonough@volpe1.dot.gov</a></td>
</tr>
<tr>
<td>Lux, Robert A.</td>
<td>Shell Oil Products Company, 777 Walker St, PO Box 2099, Houston, TX 77002</td>
<td>713-241-5334 Fax: 1124</td>
<td></td>
</tr>
<tr>
<td>Mosinskis, George</td>
<td>Southern California Gas Company, 555 West 5th St, MS: 23G1, Los Angeles, CA 90013-1011</td>
<td>213-244-5317 Fax: 8232</td>
<td><a href="mailto:gmosinskis@mx.pacent.com">gmosinskis@mx.pacent.com</a></td>
</tr>
<tr>
<td>Rees, Cherie</td>
<td>Mid-America Pipeline Company, 1800 S. Baltimore Ave, Post Office, Tulsa, OK 74101-0645</td>
<td>918-581-1485 Fax: 581-1895</td>
<td>Email: <a href="mailto:cherie@mapcoinc.com">cherie@mapcoinc.com</a></td>
</tr>
<tr>
<td>Stiles, Foster B.</td>
<td>Battelle Memorial Institute, 505 King Avenue, Columbus, OH 43201</td>
<td>614-424-4856 Fax: 3315</td>
<td>Email: <a href="mailto:stulen@battelle.org">stulen@battelle.org</a></td>
</tr>
<tr>
<td>Smith, Robert A.</td>
<td>DOT/RSPA/Volpe Center, 55 Broadway, Kendall Square, Cambridge, MA 02142</td>
<td>617-494-2654 Fax: 3257</td>
<td>Email: <a href="mailto:bobsmith@volpe1.dot.gov">bobsmith@volpe1.dot.gov</a></td>
</tr>
<tr>
<td>Sturmsa, Don</td>
<td>Supervisor, Engineering and Safety, Iowa Department of Commerce, Lucas State Office Building, Des Moines, IA 50319</td>
<td>515-281-5546 Fax: 5329</td>
<td></td>
</tr>
<tr>
<td>Thorpe, C. J.</td>
<td>Battelle Memorial Institute, 505 King Avenue, Columbus, OH 43201</td>
<td>614-424-4856 Fax: 3315</td>
<td>Email: <a href="mailto:stulen@battelle.org">stulen@battelle.org</a></td>
</tr>
<tr>
<td>Yee, Paul</td>
<td>Battelle Memorial Institute, 505 King Avenue, Columbus, OH 43201</td>
<td>614-424-4856 Fax: 3315</td>
<td>Email: <a href="mailto:stulen@battelle.org">stulen@battelle.org</a></td>
</tr>
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</table>
COMMUNICATIONS PLAN FOR
EFFECTIVE PUBLIC COMMUNICATION AND INVOLVEMENT
IN THE PIPELINE SAFETY
RISK MANAGEMENT DEMONSTRATION PROGRAM

I. INTRODUCTION

Over 1.9 million miles of pipelines provide energy for power generation, heating, cooking and transportation for American homes and businesses. Pipelines are a complex network, operated under varied conditions. Currently, the agency responsible for the oversight of natural gas and hazardous liquid pipelines, the Office of Pipeline Safety (OPS), applies relatively uniform safety requirements to pipelines. The existing requirements, however, may no longer provide the best protection for individual pipelines nor are they flexible enough to respond to changing technology. Today, opportunities such as risk management exist to take advantage of new technologies to provide better protection along pipelines and to address pipeline-specific issues. The goal of risk management is to permit pipeline operators to allocate safety expenditures to areas that pose the greatest risks to people.

The Pipeline Risk Management Demonstration Program (the Program) is designed to evaluate risk management as an alternative to the existing regulatory system. Congress provided statutory authority for this Program in 1996. The President provided further policy direction on implementing the Program in a letter to the DOT Secretary, emphasizing the need to achieve superior protection through this Program and to provide meaningful opportunity for public comment. Under the Program, operators who volunteer to participate would propose a project that identifies and proposes cost effective solutions to important safety problems. OPS would oversee the project to make sure that the overall result on the pipeline system is public and environmental protection that is superior to what can be achieved currently.

To prepare to implement the Program, OPS worked with states, public representatives and industry through a quality action team process. We also researched use of risk management in other agencies and other industries. To implement the Program in the most structured and accountable manner, OPS and its partners created these essential Program building blocks:

- a Program Standard that guides operators on developing risk management programs;
- a Training program for government and industry;
- Performance measures guidance for evaluating individual projects, and the effect of the demonstration program overall;
- a Communication plan that encompasses both national and local outreach and feedback; and
a Program Framework that describes OPS's plan for receiving, reviewing, approving, monitoring and evaluating demonstration projects and connects all the building blocks to guide the demonstration process.

The Communications Plan addresses the need for public participation, opportunities for receiving information about the Program, and ways to get questions answered or comments directed to OPS. The Communications Plan is designed to help people that the demonstration projects may affect and other interested stakeholders understand the Program's goals, process, safety issues, safety actions and outcomes. The Program's success depends on people understanding the value and importance of the pipeline network nationwide, how companies operate pipelines, and impacts of these operations on people and the environment. To assess risk management as a regulatory alternative, OPS, the pipeline industry, and state officials need to hear from, and respond to concerned citizens and their representatives.

II. COMMUNICATIONS PLAN PURPOSE AND OBJECTIVES

This plan identifies program goals, key messages about risk management and Program administration, and the opportunities for the public to get information and ask questions about the demonstration program activities and developments. OPS, operators in the demonstration program, and participating state agencies will provide substantive and timely responses to the public's questions about risk management in general, as well as specific projects. The expected benefits of public involvement include:

- Providing information about specific local conditions that may not be known at the federal or state level;
- Validating that government agencies have considered all relevant factors in making decisions to approve projects; and
- Local feedback as to whether the Program is accomplishing the goals for which it was designed.

There are three main objectives for the Risk Management Communications Plan:

- Informing and educating the public and their representatives about risk management;
- Providing stakeholders with the ability to achieve well-informed participation, thereby improving the risk management process; and
- Exchanging information among participants in, or affected by, the Program in a timely manner.
III. KEY MESSAGES

A. Risk Management

1. What is Risk Management?

Risk management is a comprehensive management decision making process that includes the identification and analysis of risks; the identification, analysis and selection of alternative measures to control risks; and the subsequent assessment of performance. Risk management is the means by which an organization systematically identifies and assigns resources to the greatest safety and environmental risks and other business risks that threaten the organization’s objectives. The Program is a test of whether risk management can be applied in a regulatory program to provide superior safety and environmental protection in the operation and maintenance of interstate natural gas transmission and hazardous liquid pipelines and reallocation of operator resources.

2. Why Risk Management?

By enabling pipeline operators and OPS to better understand what and where the risks are, and where and how resources can effectively reduce risk across the pipeline system, operators gain necessary flexibility to address system-unique problems. OPS and the operator gain a deeper understanding of risks to pipeline operations. Both government and industry should have a better ability to achieve superior safety and environmental protection and increased reliability of pipeline service.

B. The Risk Management Demonstration Program Process

1. Risk Management Program Standard Requirements

The Program Standard describes the basic elements and characteristics that should be contained in a company’s risk management program. The Standard has two sets of key elements. Program elements address the corporate responsibility for the structure, procedures, and practice for administering, documenting, communicating, and evaluating a risk management program. Process elements address the means (tools, models, analyses) for identifying, evaluating, and ranking risks, and selecting actions to control and reduce risks. As drafted, the Standard will enable operator risk management plans to vary in complexity depending on the nature and extent of the risks being addressed in a demonstration project. Because risk management is a continuous improvement program, as new data become available, the operator makes adjustments accordingly.
2. How the Process Would Work

OPS will carefully assess proposed demonstration projects to determine whether superior safety and environmental protection can be achieved. Before OPS issues an order approving a risk management demonstration project, OPS with technical input from affected State and other pipeline safety officials will screen potential applicants; consult with selected applicants; and review, negotiate, and approve final projects as appropriate. Each operator must have a plan to communicate with the public and their representatives. Each project will be guided by a monitoring plan to evaluate progress against expectations. Monitoring is an essential element of risk management. OPS will carefully audit the projects to be sure that milestones are met or appropriate adjustment made. Each project will be subject to review and modification. OPS will notify local officials directly about project objectives, planned activities, the monitoring points and will provide updates on a periodic basis.


The government’s fundamental responsibilities and authorities remain the same. OPS and its state partners will continue to set the standards for, and independently assess, pipeline safety and integrity. Oversight will be enhanced as government agencies better understand how pipelines are operated, how and why operators make risk-based decisions, options for reducing risk, and whether the intended results are occurring.

4. Setting Clear and Ambitious Performance Goals

Improved accountability is a key factor in risk management. OPS along with representatives of state pipeline safety agencies and industry have developed guidance on performance measurements for operators in the Program to evaluate the results of the process. Some of the performance measures are designed to evaluate whether superior safety and environmental protection are achieved through this alternative means of government oversight of industry. Other performance measures are designed to monitor other expected benefits, namely an improved ability of government and industry to realize the desired safety, environmental and reliability outcomes. The performance measures guidance documents identify specific questions that will be asked and measures that help answer these questions. Improved accountability by OPS and the operator to the public and their representatives should be possible with these measures. As experience is gained during the Program, it is expected that significant lessons will emerge, and the performance measures will evolve over time.
5. **Building the Risk Management Demonstration Program through Partnerships**

OPS, the pipeline industry, and State and local representatives formed a partnership to examine what risk management offered government and industry and how to apply risk management in pipeline regulation. Representatives from government and industry worked together to build a technical standard, performance measures, a training program, and this communications plan. The partnership has enhanced and is expected to continue to enhance the quality of the products and improved information exchange between all parties planning the Program.

6. **The Demonstration Program Welcomes Public Input**

Improving public involvement has been a Program goal from the beginning. Government and industry sought public input through the November 1995, the May 1996, and the January 1997 risk management public meetings. The public's views have also been sought through the OPS home page on the Internet (HTTP://ops.dot.gov/confer.htm), presentations to groups representing emergency responders and state and local officials, newsletters, and Federal Register (FR) notices. When projects have been screened for additional consultation, the public will be provided telephone contacts in OPS, state agencies and companies who can answer questions about specific demonstration projects that have been proposed or approved. We will also prepare and distribute project-specific prospectus, described in the last section of this plan.

7. **Opportunities to Address Public Concerns**

The demonstration project review, negotiation, approval, and communication process is designed to give affected stakeholders appropriate opportunities to raise their concerns and seek information about the demonstration projects.

8. **Maintaining Safeguards**

While risk management is based on choices about where resources should be allocated, all locations along pipelines in demonstration projects will be safeguarded. OPS and the states will continue to oversee all pipelines involved in demonstration projects to determine that pipeline integrity is maintained and protection against threats such as corrosion, excavation damage, overpressure, and human error is working as intended.
9. **Focusing on Those Who Can Succeed**

The Program Standard and Framework process that OPS has proposed provides many checks and balances on the selection process. The process is intended to select companies that will comply with the standard, can achieve superior protection through risk management, will work in partnership with OPS to evaluate the merits of risk management and the technologies available, and have a corporate commitment to use the risk management process as a day to day part of their business practices. The selection criteria favors the most comprehensive applications to be selected for the Program. An individual communications program is required for the company, including providing meaningful opportunity for public comment for consideration by the company and OPS. The company must have a clear and established record of compliance.

10. **Enforceable Agreements and Incentives to Perform**

Just as the traditional regulatory system provides a clear process to monitor and enforce performance, so must the risk management alternative. Once OPS approves a formal application and work plan, an order will be issued and notice made to the public through the Federal Register that the order is in effect. The order, in addition to exempting an operator from the applicability of specified pipeline safety regulatory requirements for the period of the demonstration, would set forth the terms and conditions for the operator’s participation in the project. The order would be enforceable.

OPS will have an audit plan that monitors how well the operator is meeting the performance measures. OPS’s full statutory authority to inspect pipeline facilities remains in effect. Should any unsafe conditions arise, OPS will use appropriate administrative action to ensure that such conditions are quickly addressed. OPS would also administer civil penalties within the existing regulations for operators not complying with the order.

11. **OPS Regulatory Program Maintained**

The OPS regulatory program which has been in place for 25 years will continue to be the means of oversight of all pipelines not volunteering to participate in the Program.

C. **Risk Management Demonstration Program Expected Benefits**

1. **Risk Management will Allow Pipeline Safety Programs to be Tailored to Local Conditions**

Risk management would enable pipeline operators and OPS to focus attention on those systems and locations where there is the greatest need and opportunity for risk reduction, while maintaining overall safety and environmental protection and pipeline reliability. The goal is to design safety programs that best address pipeline-specific conditions.
2. Risk Management Would Provide Increased Operator Flexibility with Continued Safety

Because risk management permits operators to use their knowledge to tailor their safety plans to their unique system conditions, operators have greater incentive to find risks and devise the best ways to address them. At the same time, OPS’s ability to oversee pipeline operations is enhanced through better understanding of these risks and more opportunity to influence the operator’s risk control decisions.

3. Risk Management Would Help OPS Protect the Public and the Environment Better

While the traditional approach to safety is effective in determining if prescribed safety requirements are carried out, it does not provide a structured process to identify risks or validate the solutions being implemented. Risk management is designed to provide a more complete understanding of risks, and to produce the most appropriate and cost effective mix of actions for any risk, consistent with a base level of safety and environmental protection.

4. Risk Management Would Yield Improved Information for Policy and Decision-Making

Because risk management is predicated on thoroughly identifying and understanding potential threats to a pipeline system, the risk management approach to safety will generate data that will better inform both operators’ and regulators’ decisions. OPS hopes the Program experience will help to better understand what the critical data are for a wide range of risks and system configurations, and effective performance monitoring.

IV. COMMUNICATIONS & OUTREACH

The Program’s communication strategy and implementation has two complementary components: a national component and a project component.

At the national level, the public was invited to comment on proposed Program Framework concepts via formal notice in the Federal Register in September 1995, December 1995, and November 1996. OPS has held two public meetings and has scheduled a third for January 28, 1997, in New Orleans, LA. At the third meeting, OPS plans to present its approach and answer questions on the planned oversight of the Program. The review and approval process will be demonstrated using prototype risk management projects. The public is invited to ask questions and provide comments at this meeting and on other occasions. OPS is briefing national organizations representing public, safety and environmental interests to provide a program overview and to establish a means of identifying local officials in the areas of the demonstration sites when they are selected. Examples of these organizations are the National...
Governors Association, the National League of Cities, the National Towns and Townships, and
the International Association of Fire Chiefs. We will continue to pursue briefing opportunities.
All the organizations who have been briefed have expressed an interest in working with OPS.

The requirement for local level communications by the operator is recognized in the Program
Standard. The operator needs to have an external communications program. Through such a
program, public and other stakeholder interests and concerns should be identified, discussed and
addressed, and program goals and results communicated to the public. Pipeline operators may
build on their existing plans.

After the screening process and before the OPS-operator consultations, OPS will publish 1) a
local prospectus on each demonstration project and 2) a FR notice describing the demonstration
projects under consideration. Both notifications will describe briefly each company's concept for
communicating with state and local officials and other interested stakeholders. The prospectus
and FR notice will describe the proposed project objectives and risk control activities. When the
proposed performance measurements that will be used to monitor project progress become
available, or other data from the consultative process becomes available, OPS will provide an
update to the project prospectus. At this time, a summary of the formal application will be
published in the Federal Register, and the application itself will be made available for review and
comment through the public docket at the Department of Transportation. When OPS has
approved the applications, notification will be made through an FR notice.

At both occasions prior to project approval, OPS will conduct an active outreach program to
reach national and local public organizations about the sites under consideration so that local
officials can be notified and informed about planned project activities. OPS will also contact
environmental and other interested organizations. OPS hopes to identify on each project
prospectus three contact points for knowledgeable representatives at OPS, the company and the
state. Officials would have three sources available to whom they can provide comments and ask
questions, and from whom they can get timely and substantive responses about specific project
objectives, activities and performance.

States which demonstration projects affect may provide advice for OPS to consider in its
decision to approve a demonstration project. The prospectus will identify state officials who
have agreed to serve in an advisory capacity and with whom the public could raise questions
about demonstration projects. The public may also contact OPS or the company directly.

OPS invites comments throughout the demonstration project on ways we can make the
communications program more meaningful. OPS, state pipeline agencies and operators
participating in demonstration projects will be planning periodic briefings throughout the four
year Program to provide updates on progress.

January 13, 1997
Risk Management Orientation

Draft Course Outline

1. Introduction

2. Pipeline Risk Management Demonstration Program

3. Project Review Team Roles and Responsibilities

4. Evaluation of an Operator's Risk Management Program

5. Audit Plan Preparation

6. Monitoring, Modification, and Termination of Demonstration Projects

7. Practical Applications

8. Summary Session

January 14, 1997
Risk Management Demonstration Program Orientation

Draft Course Material Outline

1. Introduction
   a. Welcome Participants/Logistics and Administrative Matters
   b. Risk Management Demonstration Program Orientation Objectives
   c. Why is Change Necessary?
   d. What is Risk? - Basic Principles and Definitions
   e. What is Risk Management?
   g. Evolution of the OPS Risk Management Program
   h. Risk Management Demonstration Program Objectives
   i. Other Terminology and Basic Definitions
   j. Key Questions and Answers about the Risk Management Demonstration Program

2. Pipeline Risk Management Demonstration Program
   a. Introduction and Review of Block Objectives
   b. OPS Risk Management Program Overview - The Process Steps
   c. Key Components of the Demonstration Program
      i. Regulatory Framework
      ii. Risk Management Program Standard
      iii. Risk Management Review Protocols and Criteria
      iv. Risk Management Performance Measures
      v. Communications Plan

January 14, 1997
3. **Project Review Team Roles and Responsibilities**

   a. Introduction and Review of Block Objectives
   
   
   c. Consultation and Negotiation with the Operator to Reach Mutually Acceptable Terms for the Project
   
   d. Recommendation of Acceptance or Rejection
   
   e. Development of an Audit Plan
   
   f. Monitoring Demonstration Project Performance
   
   g. Modifying or Terminating Approved Projects
   
   h. Summary of Legal Issues

4. **Evaluation of an Operator's Risk Management Program**

   a. Introduction and Review of Block Objectives
   
   b. Overview of Review and Approval Process
   
   c. Purpose of Review Protocols and Criteria
   
   d. Information Provided by the Operator to OPS
   
   e. Application of Primary Review Criteria

      i. Demonstration Project Consistency with Program Standard (Criterion #1)

         (1) Risk Management Program Elements/Integration of Risk Management with Company Operations (Secondary Criterion #1.1)
         (2) Risk Assessment Process (Secondary Criterion #1.2)
         (3) Risk Control and Decision Support (Secondary Criterion #1.3)
         (4) Performance Monitoring and Feedback (Secondary Criterion #1.4)
ii. Determination of Superior Level of Safety (Review Criterion #2)
   
   (1) Clear Definition/Description of Alternatives (Secondary Criterion #2.1)
   (2) Risk Reduction is Basis for Superior Safety (Secondary Criterion #2.2)
   (3) Safeguarding Safety when Eliminating Redundant Activities (Secondary Criterion #2.3)
   (4) Compatibility of Decision Criteria with Accepted Values and Industry Practices (Secondary Criterion #2.4)

iii. Operator’s Risk Management Work Plan (Review Criterion #3)
   
   (1) Work Plan Composition: Major Milestones (Secondary Criteria #3.1 and #3.2)
   (2) Performance Monitoring Plan (Secondary Criterion #3.3)

5. Audit Plan Preparation

   a. Contents of a Risk Management Demonstration Project Audit Plan
   b. Integration of Risk Management Audits with Compliance Audits

6. Monitoring, Modification, and Termination of Demonstration Projects

   a. Monitoring

      i. Project Evaluation Using the Audit Plan and Performance Measures
      ii. Communication with Operators and Stakeholders
      iii. Demonstration Program Monitoring at the National Level

   b. Modification

      i. Potential Reasons for Project Modification
      ii. Process to Formally Change an Approved Plan

   c. Termination

      i. Potential Reasons for Early Project Termination
      ii. Process to Formally Terminate an Approved Plan
      iii. Completion of the Demonstration Program

January 14, 1997
7. Practical Applications

(Examples from the Risk Management Demonstration Program Prototypes and industry experience will be used as hands-on exercises to familiarize participants with various aspects of the Risk Management Demonstration Process. This will include facilitated, role playing exercises where the participants evaluate a risk management demonstration project proposal. Practical application exercises will emphasize the negotiation process necessary for demonstration program success.)

8. Summary Session

a. Review Key Points from Course

b. Review any Issues Requiring Follow-up by OPS Risk Management Staff
Pipeline Risk Management
Demonstration Project

Review Protocols & Criteria

DRAFT

January 1, 1997
Table of Contents

I. Overview ................................................................. I-1
   The Program Framework ......................................... I-1
   The Risk Management Program Review Protocols and Criteria ..................................... I-3

II. Objectives and Guiding Principles .................................... II-1

III. Screening of Potential Applicants ................................... III-1
   III.1 Screening Protocols ........................................... III-1
      III.1.1 The Information Submitted ................................. III-1
      III.1.2 The Screening Process .................................. III-2
      III.1.3 Roles and Responsibilities .............................. III-3
   III.2 Screening Criteria ............................................. III-4

IV. Review of Demonstration Project Applications ........................ IV-1
   IV.1 Review Protocols ............................................... IV-1
      IV.1.1 The Information Submitted ................................. IV-1
      IV.1.2 The Review Process ....................................... IV-3
      IV.1.3 Roles and Responsibilities .............................. IV-5
   IV.2 Review Criteria ................................................ IV-7

V. Establishing an OPS Audit Plan ...................................... V-1
   V.1 Content of the OPS Audit Plan ................................. V-1
   V.1 Responsibility for Developing and Implementing the Audit Plan ............................. V-1

VI. Modifying an Approved Demonstration Project ..................... VI-1
   VI.1 Protocols for Modifying an Approved Project .......................... VI-1
   VI.1 Responsibility for Modifying an Approved Project .......................... VI-1
   VI.1 Criteria for Modifying an Approved Project ...................................... VI-2

VII. Terminating an Approved Demonstration Project .................. VII-1
   VII.1 Protocols for Terminating an Approved Project ................................ VII-1
   VII.1 Responsibility for Terminating an Approved Project ................................ VII-1
   VII.1 Criteria for Terminating an Approved Project ................................ VII-2

VIII Opportunities for Meaningful Public Involvement .................. VIII-1

January 1, 1997
I. Overview

The Accountable Pipeline Safety and Partnership Act of 1996 requires the Department of Transportation's Office of Pipeline Safety (OPS) to establish the Pipeline Risk Management Demonstration Program.

The demonstration program will test whether allowing operators the flexibility to allocate safety resources through risk management is an effective way to improve safety, environmental protection, and system reliability. The demonstration program will also provide information on how to administer risk management as a permanent feature of the Federal pipeline safety program, should risk management prove to be a viable regulatory alternative. The new standards, technologies, and communication processes developed by operators and OPS for the risk management demonstration projects will be adapted to support the range of risk-based regulatory, compliance, and research and development activities OPS presently has under development.

I.1 The Framework for the Risk Management Demonstration Program

OPS has developed a Program Framework for Risk Management Demonstrations that provides guidance on the overall process by which OPS will review, negotiate, approve, monitor, and modify risk management demonstration projects submitted by pipeline companies. Earlier framework concepts were published in the Federal Register on September 21, 1995 (60 FR 49040), and December 20, 1995 (60 FR 65725). OPS intends that the demonstration projects will operate per the general guidelines given in Federal Register Notice published November 15, 1996 (61 FR 58605). The Program Framework provides an overview discussion of the demonstration program; describes activities OPS and industry activities currently underway to develop the demonstration program and the next steps in the development process; describes the objectives and policies of the risk management demonstration program; and outlines the process for selecting demonstration projects. A subsequent notice (early 1997) will specify application deadlines and begin the eligibility process.

Key steps in the OPS review and approval process include:

1. Letter of Intent

Operators notify OPS of their interest in participating in the pipeline risk management demonstration program. The Letter of Intent provides a general discussion of how the company applies risk management principles as part of its operating philosophy, a brief system profile of the pipeline, describes the scope of the company's risk management demonstration project, describes any new technologies and processes that will be developed or deployed during the demonstration project, and describes the means by which the company will communicate with local officials concerning the demonstration project.
OPS screens operators based on their Letters of Intent to ensure that only companies whose demonstration projects satisfy the overall objectives of the pipeline risk management demonstration program and have a reasonable likelihood of being approved by OPS expend the resources to develop formal applications. This screening also limits the number of formal applications to ten, the maximum number of demonstration projects that OPS can reasonably evaluate and, if selected, to monitor.

*The protocols and criteria that will be used by OPS in this screening step are provided in Section III. These criteria are based on the Risk Management Demonstration Program Objectives and Policies as described in the Program Framework.*

2. **Consultation**

OPS invites each operator submitting a promising Letter of Intent to a consultation with an OPS Project Review Team (PRT). The PRT is comprised of Federal regulators. The PRT will be provided input by affected state regulators, OPS Headquarters and Regional staff, and, as necessary, risk management and other technical contractors.

The purpose of the consultation is to familiarize OPS and affected States with specific aspects of the operator's risk management demonstration project, to provide guidance to the operator on what refinements (if any) will be needed for OPS to approve the demonstration project, to enable regulators to plan the expected level of monitoring, and to enable regulators and the operator to come to agreement on the roles and responsibilities of each throughout the project duration.

The consultation will focus on the design, operations, and maintenance practices that would replace practices required by 49 CFR Part 192 or 195, and that would achieve superior overall safety, environmental protection, and reliability. Other topics include a plan for OPS audits, proprietary issues, provisions for public communication, and the company workplan.

In the consultation, which is expected to occur at the company site, the operating company:

1) describes the objectives and scope of its demonstration project;

2) delineates the risk control activities it proposes to perform under the risk management demonstration project, including any design, operations, or maintenance practices that the company would propose to replace practices currently required by the regulations;

3) provides the basis for and justifies the proposed risk control alternatives by describing the risk management models, processes, and data supporting the company's decisions;
4) describes the performance measures and the performance monitoring plan it plans to use to assure that superior performance is achieved;

5) describes the proposed plans for communication with public officials and other stakeholders.

The PRT reviews the applicant's presentation and provide comments. The consultation begins an interactive evaluation process that results in a demonstration project that OPS could approve.

To allow the PRT to focus efficiently on the key safety and environmental issues during the consultation, OPS staff may meet prior to the formal consultation with operator personnel to obtain basic information about the proposed demonstration project, physical aspects of the pipeline segment(s) involved, and the company's risk management program and technical process. The OPS staff will brief the PRT prior to the consultation, providing basic background and programmatic information.

*The review protocols and criteria that will be used to guide the PRT during these consultations and discussions (and then subsequently to review and approve the formal applications that emerge from the consultation process) are provided in Section III. The review criteria are based on, and structured around, the major elements of a company's risk management program as defined in the Risk Management Program Standard.*

3. **Formal Application and Approval**

Following the consultations, an operator submits a written application formally indicating its intent to enter into a risk management demonstration project. The formal application, which would reflect operator/PRT resolution of issues raised during the consultation process, would summarize the following information:

1) the objectives and scope of its demonstration project;

2) the risk control activities it proposes including any design, operations, and maintenance practices that the company would propose as alternatives or additions to practices currently required by the regulations;

3) the basis and justification for the conclusion that the proposed risk control alternatives and additions will produce superior safety, environmental protection, and reliability.

4) any operator/OPS agreements on specific items discussed during the consultation and any follow-up discussion and evaluations;
5) a demonstration project work plan, including implementation milestones, points-of-disclosure, and any planned or potential expansions to the project scope;

6) a company performance monitoring plan that defines the performance measures it will track and the type, frequency, and scope of company audits, evaluations, and assessments used to ensure that the demonstration project is providing superior levels of performance;

7) the company's plan to communicate with public officials and other stakeholders concerning its risk management program.

OPS reviews the application and decides whether to approve the project. If OPS decides to approve the project, OPS issues the operator a written order. The order, in addition to exempting an operator from the applicability of specified pipeline safety regulatory requirements for the period of the demonstration, would set forth the terms and conditions for the operator's participation in the demonstration project. The order would be enforceable.

_The review protocols and criteria that will be used by the Project Review Team to review and approve the formal application are provided in Section III._

4. **Implementation**

The risk management demonstration project can begin as soon as OPS approves the formal application, issues the order, and notifies local safety officials. Both regulators and operators monitor the risk management demonstration projects for compliance with the order. The operator monitors performance in accordance with the performance monitoring plan submitted as part of its application and approved by OPS.

OPS develops and provides the operator with an OPS Audit Plan describing the regulators' expected level of effort in monitoring the demonstration, including the type of audits, their frequency, the participants, the audit scope, and the operator's means of addressing those aspects of the demonstration site remaining in compliance with the regulations. This Audit Plan would not limit OPS's statutory authority to inspect any pipeline facility during the period of the demonstration.

_The processes and responsibilities for developing the OPS Audit Plan are described in Section V._

During the course of the demonstration project, new information may arise or result from the monitoring program that would suggest the need or desire to modify the program. An operator would notify OPS of any intent to make substantive modifications to the risk management project once a demonstration is underway. Similarly, OPS through its audit plan may recognize a need for project modification.
The PRT may reconvene to review such modifications and renegotiate project approval. Provisions will be made for public review and comment on renegotiated projects.

OPS could, through appropriate administrative action, address any unsafe conditions that arise during the demonstration period to ensure that such conditions are quickly addressed. OPS would also administer civil penalties within the provisions of the existing regulations for operators not complying with the order.

The processes and responsibilities to modify an approved risk management demonstration project are described in Section VI.

5. Termination

The need or desire may arise to terminate a risk management demonstration projects during or at the end of the demonstration period. Termination might be proposed by the company or required by the OPS.

The processes and responsibilities for terminating risk management demonstration projects are described in Section VII.

I.2 The Demonstration Project Review Protocols & Criteria

The above program framework entails two major review and approval steps for OPS: 1) the screening of initial participants based on their Letter of Intent, and 2) the review/approval of formal company applications. This set of Risk Management Demonstration Project Review Protocols and Criteria is designed to support OPS in performing these review and approval steps by describing the roles, responsibilities, and processes for performing these activities and by establishing the criteria by which the approval will be determined.

These Review Protocols and Criteria are also designed to support OPS in establishing an OPS audit plan, in approving modifications to demonstration projects based on new information and lessons learned, and in the termination of approved demonstration projects.

These Review Protocols and Criteria are designed to help OPS ensure achievement of the program objectives and guiding principles delineated in the Program Framework described in the Federal Register Notice of November 15, 1996 and the Risk Management Program Standard developed by the Joint Risk Management Program Standards Team.

These Review Protocols and Criteria describe the information that is expected to be submitted by pipeline operators to the reviewers; the processes by which the regulators will review the submissions; and the roles, responsibilities, and authorities of OPS and other parties within these review, approval, audit, modification, and termination processes.

I-5 January 1, 1997
Training will be provided to all PRT members and support staff in the implementation of these Protocols and Criteria.

The Review Criteria are the specific factors upon which the screening, approval, modification, and termination decisions will be based. The criteria are designed to guide the reviewers and to provide a structured, consistent, and traceable basis for decisions. The criteria are structured in the following format:

### Criterion Statement: A characteristic that needs to be satisfied by the proposed risk management demonstration project. (e.g., "the risk management project shall describe the physical breadth of the pipeline system included in the program's scope.")

Supporting criteria that define the characteristics of projects that satisfy the primary criteria. The supporting criteria guide and structure the review process, but satisfaction of each supporting criterion is not necessary to satisfy the associated primary criterion.

**Evaluation:** The reviewer selects one of the following choices:

Does the operator's risk management demonstration project adequately describe the physical breadth of the pipeline system included in the program's scope?

A. Yes ____
B. Requires Additional Information ____ (describe)
C. Does Not Address ____
D. Describes an Unacceptable Process or Outcome ____ (explain)

If "B" is selected, the reviewer must describe the specific additional information that is required.

If "D" is selected, the reviewer must explain the basis for the decision, including describing the specific nature of the unacceptable process or outcome, and the specific changes or additions that would make it acceptable.

In addition to the Review Protocols and Criteria, the reviewers will be supported by:

1. Risk Management training material;
2. Illustrative examples and discussions of risk management projects;
3. Input from experienced risk management experts;
4. Input from specialized technical experts.
II. Objectives and Guiding Principles

The Review Protocols and Criteria are designed to assist OPS in evaluating, approving, and modifying operating company risk management demonstration projects that will achieve the objectives of the pipeline risk management demonstration program, and which are consistent with the guiding principles of risk management set forth in the Risk Management Program Standard.

II.1 Objectives of the Risk Management Demonstration

The objectives of the pipeline risk management demonstration program, as stated in the Federal Register, are to:

- Determine if more effective allocation of resources can result in improved safety and environmental protection over what is presently achieved through regulatory compliance;

- Address risks not addressed by the regulations by capitalizing on features inherent to the risk management process, such as improved quality and integration of safety data, and as a result, more comprehensive assessment of threats,

- Systematically test risk management as a regulatory alternative through objective evaluation under a broad range of conditions,

- Establish a common framework for productive communication with public safety officials and the public, and for getting meaningful public input into the risk management process,

- Develop and apply new risk assessment models, processes, and technologies

II.2 Guiding Principles for Risk Management Programs

The following guiding principles describe the key over-riding attributes and characteristics that all risk management programs, including the risk management demonstration projects, should exhibit. These guiding principles are extracted directly from the Risk Management Program Standard and can be used by reviewers of risk management demonstration projects to help assure that the overall objectives of the integrated project will be achieved by the collective effect of the project's individual parts.
1. *Risk Management is a comprehensive management decision support process, implemented as a program, integrated through defined roles and responsibilities into the day-to-day operations, maintenance, engineering, and management of the operator.*

Risk management produces, structures, and presents the best available risk information to support and facilitate better management decision making.

Risk management allows management decisions and their bases to be more easily communicated.

Risk management is a comprehensive management decision making process that includes the identification and analysis of risks; the identification, analysis, and selection of alternative measures to control risks; and the subsequent assessment of performance.

Risk management does not replace pipeline company managers or regulators with computer models. Corporate managers and regulators make decisions. These decisions are aided by, but not dictated by, technical models and quantitative analyses.

Risk management is an integrative process, allowing operators and regulators to address multiple aspects and practices of pipeline design, operation, and maintenance in a combined, holistic way to maximize overall benefits.

Risk management is a continuous process, with initial output from any portion of the process often being updated and refined using information fed back from subsequent portions of the overall decision making and implementation process.

Risk management requires corporate management leadership, commitment, and accountability. Clear lines of responsibility and accountability for risk management need to be established from the highest level of management down.

2. *Risk can be controlled through the cost-effective application of finite resources.*

Risk management logically structures, brings consistency to, documents, and clarifies the tradeoffs of risks, uncertainties, and benefits among competing alternatives.

Risk management inherently involves subjective trade-offs among different, and often competing, goals.

Risk management allows experienced operators and regulators to apply best engineering practices and judgement to develop integrated solutions to pipeline safety problems as an alternative to event-driven, regulatory-directed solutions.
3. **Risk cannot be totally eliminated.**

Risk is an inherent part of life and is associated with all industrial activities.

The overall risk of a pipeline can be reduced, controlled, or altered, but it cannot be reduced to zero.

The process or result of reducing risks of one source or type can affect risks of another source or type.

4. **Risk management increases, integrates, and enhances the value of information concerning pipeline safety.**

Risk management requires suitable and sufficient data to be developed and maintained concerning system design and operational characteristics, including reliability and maintenance histories of pipeline system components. In many cases this information exceeds that which is currently developed, maintained, and reported.

Risk management addresses both the likelihood and consequences of pipeline incidents. In this context, “incidents” refers to unwanted events such as failures, accidents, unintended releases, leaks, and near misses.

Risk management addresses the entire life cycle of the pipeline system, considering the interfaces and dependencies among pipeline design, construction, operation, and maintenance.

Risk management examines the entire spectrum of risks, from the relatively frequent minor events that pose little or no risk, to the very low probability incidents that could cause significant harm.

Risk management identifies and assesses the relative merits of activities to reduce the likelihood of incidents as well as activities to mitigate the consequences of incidents should they occur.

By placing each source of risk in its proper perspective, and by depicting the relative impact of potential risk-reduction measures on overall risk, risk management can facilitate communication among operators, regulators, and the public concerning the nature of pipeline risks and the rational basis for decisions on how to manage these risks.
5. Risk management programs are structured but flexible, allowing customized approaches to be developed for specific issues and situations, encouraging innovation, and supporting continuous improvement.

There are numerous levels of detail and model complexity that can be beneficially developed and implemented within a risk management program. The technical models used within the program should be commensurate with the level and type of the risks being analyzed, and should be capable of generating the level of information detail and confidence needed to support the specific decisions being made.

Risk management programs should be implemented as an ongoing, "living" program, evolving and continuously improving as experience is gained and new data is obtained.

6. *The implementation of a risk management program should result in superior public safety and environmental protection*

Risk management programs should produce additional information about existing risks and define more effective options to address and reduce these risks.

Risk management programs include performance measures and an explicit and visible monitoring, tracking, and reporting of progress against expected outcomes.
III. Screening of Potential Applicants

An operator interested in participating in the pipeline risk management demonstration program notifies OPS through a Letter of Intent. OPS reviews the Letters of Intent and screens applicants. The objectives of the screening process are to:

1) Ensure that all applicants will submit applications that are consistent with the objectives of the risk management demonstration program;

2) Ensure that only those companies whose demonstration concepts have a reasonable likelihood of being approved expend the time and resources to develop formal applications;

3) Allow OPS to limit the number of demonstration projects to ten.

III.1 Screening Protocols

In order to ensure that all operating companies with an interest in participating in the risk management demonstration program are treated fairly, and to ensure that the set of selected demonstration projects best support the overall objectives of the demonstration program, the screening is performed through a structured, documented process with defined roles, responsibilities, and authorities, and with pre-defined screening criteria to guide the decision-makers.

III.1.1 The Information Submitted

The information that is examined as part of the screening process is contained in the operating company's Letter of Intent. This document contains at least:

- a brief system profile of the portion of the pipeline included in the demonstration project, including product(s) transported; pipeline age and operating history; and types of population distributions and geographic conditions in proximity to the pipeline;

- a general description of the scope of the risk management demonstration project, including:
  - the physical boundaries of the pipeline system that will be addressed within the demonstration project;
the portions of the life cycle that will be addressed;

the breadth of the analyses (e.g. will all types of failure modes and potential solutions be considered, or will the demonstration project focus on specific types of failure modes?);

the potential for expansion of the project’s scope during the demonstration period.

- any new technologies and processes to be developed or deployed during the demonstration phase;

- a general description of any specific alternative or additional safety practices it intends to propose and the affected regulations;

- evidence that all considerations raised in the Risk Management Program Standard will be addressed in the company’s risk management demonstration project;

- a description of the means by which the company will communicate with local officials regarding its demonstration project;

- a general description of risk management principles as part of the company’s operating philosophy;

- a statement and evidence of corporate commitment to risk management.

III.1.2 The Screening Process

The screening process is comprised of the following steps:

1) Initial Completeness Review and Categorization

An initial log-in, completeness review, and categorization is performed on all Letters of Intent received by OPS to facilitate and focus subsequent evaluation and screening steps. No company projects are screened out at this point.

Each Letter of Intent is assigned a control number and logged-in as it is received by OPS. This will facilitate document control and communication among OPS reviewers. Each Letter of Intent will be included in the OPS Risk Management Information System (RMIS).
Each Letter is examined by OPS staff to determine if it contains the required elements and information, and key information concerning the operating company and the scope of the proposed risk management demonstration project are captured.

Two products are produced in this step:

- An Information Sheet is produced for each Letter of Intent that summarizes key information contained in the Letter. The Information Sheet will also be included in the OPS RMIS.

- A Letters of Intent Tally Sheet is maintained that counts and lists the number of proposed projects with certain characteristics (e.g. the number of natural gas pipeline demonstration projects in the Western Region).

2. **Evaluation**

Each Letter of Intent is reviewed and evaluated jointly by the OPS Screening Committee. This evaluation will result in an "acceptable" or "unacceptable" designation based on: 1) whether the operating company is eligible to participate in the demonstration program, and 2) whether the Committee believes the operating company has shown reasonable evidence that it is committed to, and is capable of developing and implementing a risk management demonstration project that supports the objectives of the pipeline risk management demonstration program. The criteria used in this evaluation are described in Section III.2.

The OPS Screening Committee will be supported by the OPS risk management staff, who will perform preliminary analyses of each Letter of Intent using the criteria described in Section III.2, and provide summaries of findings to the Screening Committee. During the evaluation, the OPS risk management staff or the Screening Committee may request additional information from the operator to supplement or clarify the information provided in the Letter of Intent.

3. **Selection**

The group of all "acceptable" Letters of Intent is then examined by the OPS Screening Committee. The Committee will select the set of demonstration projects that it believes best achieves the overall objectives of the pipeline risk management demonstration program. The specific criteria used in this selection are described in Section III.2.

**III.1.3 Roles and Responsibilities**

The OPS risk management staff, supporting by risk management contractors, is responsible for receiving, logging-in, and performing the preliminary examination and categorization of the Letters of Intent. OPS risk management staff will provide a summary information sheet, and a preliminary evaluation of each Letter of Intent to the OPS Screening Committee.

III-3

January 1, 1997
The OPS Screening Committee is comprised of Director of the Office of Program Development and the five Regional Directors. The Screening Committee will make evaluations for the Associate Administrator, Office of Pipeline Safety, for the list of companies that will be invited to consultations.

The Associate Administrator, Office of Pipeline Safety, will have the responsibility and the sole authority to select the companies that will be invited to a consultation.

**III.2 Screening Criteria**

There are three mandatory criteria and one relative criterion that can be used to support the screening process. The mandatory criteria are those that all Letters of Intent must satisfy to be considered. These are the criteria used to determine if the Letter of Intent is "acceptable" or "unacceptable" in the evaluation step. The relative criterion are those that will be used to pick the best set of demonstration projects in the selection step.

**SC #1.** *(Mandatory)* The Letter of Intent shall provide the information required in the Federal Register Notice, and shall demonstrate that the company is eligible to participate in the pipeline risk management demonstration program.

**SC #2.** *(Mandatory)* The Letter of Intent shall provide reasonable evidence that the operating company is committed to and capable of developing and implementing a demonstration project that will produce superior safety and environmental protection.

**SC #3.** *(Mandatory)* The company's past and current safety and compliance performance shall provide confidence that the company is dedicated to the achievement of superior safety and environmental protection.

**SC #4.** *(Relative)* The company intends to implement a risk management demonstration project that, relative to other proposed demonstration projects, will help OPS achieve the objectives of the demonstration program.

Each of these criteria are discussed in more detail below.
SC #1. (Mandatory) The Letter of Intent shall provide the information required in the Federal Register Notice, and shall demonstrate that the company is eligible to participate in the pipeline risk management demonstration program.

Discussion: The Federal Register Notice delineates the information required in the Letter of Intent. The required information includes:

- a brief system profile of the portion of the pipeline included in the demonstration project, including product(s) transported; pipeline age and operating history; and types of population distributions and geographic conditions in proximity to the pipeline;

- a general description of the scope of the demonstration project, including:
  - the physical boundaries of the pipeline system that will be addressed within the demonstration project;
  - the portions of the life cycle that will be addressed (e.g., will design issues be examined, or will the demonstration project focus on operational and maintenance problems and solutions?);
  - the breadth of the analyses (e.g., will all types of failure modes and potential solutions be considered, or will the demonstration project focus on specific types of failure modes?);

- any new technologies and processes to be developed or deployed during the demonstration phase;

- a general description of any specific alternative or additional safety practices it intends to propose and the affected regulations;

- evidence that all considerations raised in the Risk Management Program Standard will be addressed in the company's risk management demonstration project;

- a description of the means by which the company will communicate with local officials regarding its demonstration project;

- a general description of risk management principles as part of the company's operating philosophy;

- a statement of corporate commitment to risk management.
The operating company may provide additional information, and the Screening Committee may ask for additional information to supplement or clarify the information provided in the Letter of Intent. For example, additional information about the pipeline may be provided that is pertinent to the risk issues or safety alternatives included in the demonstration project (e.g. specific operating data, age of the pipe, an elevation profile for liquid lines, etc.), or a general description of the technical methods the company intends to use to assess risks and the risk-reduction impacts of safety alternatives may be requested.

Eligibility requirements for participating in the pipeline risk management demonstration program include:

- The demonstration project includes any part or all of a pipeline system that is covered by either 49 CFR Part 192 or 195, and is under federal oversight or oversight by a participating interstate agent;

- The demonstration project includes any part or all of a pipeline system that is currently in operation or under conversion to service.

**Evaluation:** Does the Letter of Intent adequately respond to the information requirements of the Federal Register Notice and provide a sufficient amount of information to determine whether the company is committed to and capable of developing and implementing an acceptable risk management demonstration project?

A. Yes, the Letter of Intent is acceptable ______

B. No, the Letter of Intent is unacceptable ______

If B, state the basis for unacceptability
SC #2. (Mandatory) The Letter of Intent shall provide reasonable evidence that the operating company is committed to and capable of developing and implementing a demonstration project that will produce superior safety and environmental protection.

Discussion: Key factors to consider include:

- Does the Letter provide adequate evidence of corporate commitment? The demonstration of corporate commitment could be achieved by a corporate manager who controls the resource allocation for the demonstration project and competing operations, signing the letter of Intent. Will corporate managers with adequate budgetary authority be actively involved in making or reviewing risk management decisions?

- Is there adequate assurance that the company views risk management as an integral part of its overall safety management or pipeline integrity assurance program?

- Is there adequate assurance that the company is committed to the use of risk management to produce superior safety and environmental protection, or does it appear that the company is pursuing risk management only to obtain item-by-item relief from specific costly regulations?

- Is there adequate evidence that the company already has a significant on-going risk management program, or adequately understands and is prepared to devote the resources to develop one?

- Does the company appear to have in place or be committed to the development of technically sound processes for assessing risk and risk-reduction?

Evaluation: Does the Letter of Intent provide reasonable evidence that the operating company is committed to and capable of developing and implementing a demonstration project that will produce superior safety and environmental protection?

A. Yes, the Letter of Intent is acceptable _____

B. No, the Letter of Intent is unacceptable _____

If B, state the basis for unacceptability
SC #3. (Mandatory) The company's past and current safety and compliance performance shall provide confidence that the company is dedicated to the achievement of superior safety and environmental protection.

Discussion: Key factors to consider include:

- Has the incident rate for this company been significantly higher than other comparable systems?
- Is the company currently under a compliance order or a hazardous facility order?
- Has the operator completed all OPS-initiated corrective actions?
- Has the company's response to past incidents provided confidence that they are highly motivated to investigate and understand risks for the purposes of improving safety and environmental protection?
- Do other regulatory agencies have problems or issues with the operator's safety or environmental record?

OPS should consult its own records and consult with other interested agencies in addressing these criteria.

Evaluation: Does the company's past safety and compliance performance record provide confidence that the company is dedicated to the achievement of superior safety and environmental protection?

A. Yes, the Letter of Intent is acceptable  

B. No, the Letter of Intent is unacceptable  

If B, state the basis for unacceptability
SC #4. *The company intends to implement a risk management demonstration project that, relative to other proposed demonstration projects, will help OPS achieve the objectives of the demonstration program.*

**Discussion:** The objectives of the program, and corresponding factors to consider in the selection of projects that best serve the needs of the national program, are as follows:

- Determine if more effective allocation of resources can result in improved safety and environmental protection over what is presently achieved through regulatory compliance;

Does the proposed demonstration project intend to re-allocate resources between or among safety practices, and appear to provide clear opportunities for testing whether this re-allocation can result in improved safety and environmental protection?

Demonstration projects do not need to propose specific alternatives to current regulations to be acceptable projects. Projects that propose good risk management approaches in areas that are not now explicitly covered by regulations, or in which the regulation allows a broad interpretation of compliance also represent a very useful test of risk management as a regulatory alternative (the "alternative" being to the lack of a regulation, the need for OPS to develop and impose future regulations in the area, or to the current manner that OPS determines adequate compliance within this area).

- Address risks not addressed by the regulations by capitalizing on features inherent to the risk management process, such as improved quality and integration of safety data, and as a result, more comprehensive assessment of threats

Does the proposed demonstration project explicitly intend or have the potential to identify and address risks not covered by the current regulations?

- Systematically test risk management as a regulatory alternative through objective evaluation under a broad range of conditions,

Does the proposed demonstration project support OPS's ability to test risk management under diverse conditions, such as:

- Product type. To the extent practical, both hazardous liquid and natural gas pipelines should be represented within the selected set of demonstration projects.

- Demonstration Project Scope. Projects with sufficiently broad scope to test risk management as a regulatory alternative should be selected in preference to those of limited scope or those that could be treated as risk-based waivers under the current regulatory system.
Potential for Expansion of Demonstration Project Scope. Projects with the potential to expand over time as experience is gained should be selected in preference to those with narrow initial scope without a plan or intent to expand.

Geographic Location. To the extent practical, demonstration projects involving pipelines in different geographic regions should be represented within the set of demonstration projects.

Unique safety alternatives. To the extent practical, demonstration projects that intend to propose unique safety alternatives that promise significant improvements in safety, environmental protection, and system reliability should be represented within the selected set of demonstration projects.

Will the operator's performance measures and proposed performance monitoring program provide data to support an objective evaluation of the effectiveness of the alternative safety practices?

- Establish a common framework for productive communication with public safety officials and the public, and for getting meaningful public input into the risk management process,

Does the demonstration project include innovative means for communicating with public safety officials and the public? Does the proposed demonstration project include mechanisms for obtaining meaningful public input to the risk management process?

- Develop and apply new risk assessment models, processes, and technologies

Does the demonstration project provide the opportunity to develop and apply new models, processes, and technologies that might be useful to other companies or to OPS?

**Evaluation:** In comparison to the demonstration projects, does the demonstration project described in this Letter of Intent exhibit special or unique characteristics that will enable OPS to achieve the objectives of the national demonstration program?

A. Yes, OPS should initiate consultations with the company designed to result in a formal risk management demonstration project application

B. No, the project described does not offer OPS the best opportunity to test risk management as a regulatory alternative

If B, state the basis.

III-10

January 1, 1997
IV. Review of Demonstration Project Applications

OPS will invite selected operators that submitted a Letter of Intent to begin a consultation and discussion process leading to a formal risk management demonstration project application from the operator. The objectives of the consultation and application review process are to:

1) Ensure that all applications propose a risk management demonstration project consistent with the processes described in the Risk Management Program Standard and compatible with the Guiding Principles set forth in that Standard;

2) Ensure that all approved risk management demonstration projects will produce superior safety, environmental protection, and reliability;

3) Ensure that company work plans and OPS audit plans are in place that allow both the company and regulator to monitor performance in a timely and adequate manner.

IV.1 Review Protocols

In order to ensure that all companies submitting risk management demonstration project applications are treated fairly and consistently, and to ensure that all approved risk management demonstration projects support the overall objectives of the demonstration program, the consultation and reviews are performed through a structured, documented process with defined roles, responsibilities, and authorities, and with pre-defined review criteria to guide the decision-makers.

IV.1.1 The Information Submitted

Information concerning the applicant's proposed risk management demonstration project is provided in two ways:

1) informally, during information exchange meetings and discussions with OPS staff, and during consultation sessions with the Project Review Team;

2) formally, as part of a written application submitted to OPS.

The information exchange meetings and consultation sessions are expected to take place at the operating company's facilities.
During the consultation and discussion process, the operating company provides OPS information on:

• the objectives and scope of its proposed demonstration project,

• a description the significant risks and the risk control activities it proposes within the demonstration project, including any specific alternative safety practices it intends to propose and the affected regulations, and any safety practices not currently required under the regulations it commits to perform during the demonstration project;

• a description of the processes and models the company will use for assessing risks and risk-reduction, and comparing safety alternatives;

• a description of the programmatic elements that ensure that risk management is an integral part of the way the company does business;

• the technical basis for concluding that the proposed alternative and additional safety practices will result in superior safety, environmental protection, and system reliability;

• the specific performance measures that the company will monitor and report to OPS as evidence that the proposed alternative and additional practices are achieving superior safety, environmental protection, and system reliability;

• a work plan for implementing the demonstration project, including major demonstration project development and implementation milestones;

• the process the company plans to use to communicate with public officials and other stakeholders.

The operating company may provide additional information, and the PRT may ask for additional information to supplement or clarify the information provided in consultation sessions.

It is expected that operators participating in the Pipeline Risk Management Demonstration Program will provide all directly relevant data and background information required to enable OPS to determine whether risk management is an effective regulatory alternative that provides superior safety and environmental protection.
IV.1.2 The Review Process

The review process is comprised of the following steps:

1) Consultations

OPS invites selected operators that submitted a Letter of Intent to a consultation designed to familiarize the PRT with specific aspects of the operator's demonstration project.

During the consultation, the PRT reviews the applicant's summary presentation of its demonstration project and provide comments. The consultation begins an interactive process that results in a demonstration project that OPS could approve.

The consultation between the PRT and the company will focus on the design, operations, and maintenance practices that would replace practices required by 49 CFR Part 192 or 195, and that would achieve superior overall safety, environmental protection, and reliability.

To allow the PRT to focus efficiently on the key safety and environmental issues during the consultation, OPS staff may meet prior to the formal consultation with operator personnel to obtain basic information about the proposed demonstration project, physical aspects of the pipeline segment(s) involved, and the company's risk management program and technical process. The OPS risk management staff will perform a preliminary assessment of the consistency between the applicant's risk management demonstration project and the Risk Management Program Standard, flagging areas of apparent or possible inconsistency for attention by the PRT. The OPS staff will brief the PRT prior to the consultation, providing basic background and programmatic information, and summarizing key issues that are expected to arise during the consultation. These issues will be based on information provided in the Letter of Intent; provided by the company at technical conferences, public meetings, in technical journals; or provided through pre-consultation meetings with OPS staff.

During the consultation, the PRT can provide initial guidance to the operator on the refinements (if any) to its demonstration project required to obtain OPS approval. The consultation will also provide an opportunity for regulators and operators to discuss the expected roles and responsibilities of each throughout the project duration.

2) Evaluation

The initial consultation will begin a interactive evaluation process that would involve the company and the PRT, until a demonstration project evolves that the PRT believes meets the review criteria. During this process, the company may be asked to respond to questions raised during the consultation, or provide additional or more detailed information on its risk management demonstration project. OPS staff may be requested by the PRT to perform additional evaluations or analyses of the proposed demonstration project.
3) **Initial Review of the Formal Application**

The formal application would describe the company’s risk management demonstration project and document the agreements made with OPS during the consultations or follow-up discussions. When the formal application is first received by OPS, it will undergo a preliminary review by OPS staff. This preliminary review is designed to facilitate and focus the detailed review by the Project Review Team, by examining and summarizing the degree to which the agreements made between the company and the PRT during the consultation and discussions have been reflected in the application, flagging areas of apparent or possible differences or omissions for the PRT.

A brief summary report will be prepared and presented by OPS risk management staff to the first meeting of the PRT.

4) **PRT Review of the Formal Application**

The PRT jointly discusses and evaluates the operating company’s formal application. Individual members of the PRT will have had an opportunity to review the application prior to the PRT joint review session, and the PRT is briefed by OPS risk management staff on the results of their preliminary review.

The PRT discusses the application with respect to each of the primary review criteria (see below for a description of these criteria). Based on the group discussion, the PRT forms a position on whether the applicant’s proposed project meets each of the primary review criteria. In order to be approved, the application must be judged "acceptable" by the PRT in each of the primary review criteria. Supporting review criteria, which define elements and characteristics of risk management demonstration projects that would satisfy the primary criteria, are used to guide and structure the review process.

The PRT will assess the application and may suggest that the applicant make specific changes or additions to the application. If the PRT does not agree that a demonstration project is warranted, it must document the specific deficiencies and define the specific changes or additions that would make the application acceptable.

If the applicant is asked to make changes or additions to the application, the revised application is sent to all PRT members.
5) Approval

PRT assessments are sent to the Associate Administrator of the Office of Pipeline Safety for approval or rejection. If approved, OPS would issue the operator a written order. The order, in addition to exempting an operator from the applicability of specified pipeline safety regulatory requirements for the period of the demonstration, would set forth the terms and conditions for the operator’s participation in the demonstration project. The order would be enforceable.

IV.1.3 Roles and Responsibilities

A Project Review Team will be assigned to each potential applicant. Each Project Review Team includes representatives from:

- The OPS Headquarters risk management staff
- The OPS Headquarters compliance staff
- The affected OPS Regional Office

Prior to and during the consultations and application reviews, the PRT will also seek input and advice from:

- affected State regulators
- OPS risk management staff
- OPS Headquarters and Regional Office technical staff
- OPS risk management contractors

The OPS risk management staff (supported by risk management contractors) is responsible for:

- providing a preliminary briefing to the PRT on key issues associated with each operating company's risk management demonstration project,
- supporting the PRT during the consultation process,
- performing a preliminary review of each application, providing the results to the PRT,
- entering all formal correspondence and documents, including the company's application, OPS's letter of approval/rejection, and the associated Order in the Risk Management Information System,
- ensuring that information related to the proposed and approved modification is provided to local public safety officials and key stakeholders.

IV-5

January 1, 1997
Representatives from affected States are responsible for:

- providing input to the PRT, especially in areas where local knowledge of geography or land use might impact the demonstration project;
- respond to local safety officials as required on issues related to the demonstration project;

The PRT is responsible for:

- reviewing the operating company’s proposed risk management demonstration project as is it presented in the consultations and as it is submitted in the formal application;
- providing comments to the operating company during the consultation sessions;
- negotiating aspects of the proposed demonstration project with the company until an acceptable project evolves;
- reviewing the operating company’s formal application;
- providing an assessment of the application to the Associate Administrator, Office of Pipeline Safety.
- development of an OPS audit plan customized to each company’s risk management demonstration project (see Section V).

The Associate Administrator, Office of Pipeline Safety, is responsible for, and has sole authority to approve or reject an operating company’s application.
IV.2 Review Criteria

There are two levels of review criteria that the PRT will use to evaluate risk management demonstration applications:

1) Primary criteria, which establish the basic requirements that an acceptable risk management demonstration project must satisfy;

2) Supporting criteria (associated with each primary criterion), which define the characteristics of projects that satisfy the primary criteria. The supporting criteria guide and structure the review process, but satisfaction of each individual supporting criterion is not necessary to satisfy the associated primary criterion if the PRT believes that the fundamental intent of the primary criterion has been met.

The primary review criteria are:

RC #1: The proposed risk management demonstration project is consistent with the Risk Management Program Standard and compatible with the Guiding Principles set forth in that Standard;

RC #2: The proposed risk management demonstration project is expected to produce superior safety, environmental protection, and reliability;

RC #3: The proposed risk management demonstration project includes a company work plan and a performance monitoring plan that will provide adequate assurance that superior safety and environmental protection is being achieved.

These criteria, and the supporting criteria associated with each of them, are presented below.
**RC #1:** The proposed risk management demonstration project is consistent with the Risk Management Program Standard and compatible with the Guiding Principles set forth in that Standard;

1.1 The risk management demonstration project is an integral part of the way the applicant company operates its pipeline, adequately addressing the program elements described in the Risk Management Program Standard.

1.1.1 Risk management policies are established, understood (both within and outside of the organization), implemented, and maintained.

1.1.2 The demonstration project documentation shall define roles and responsibilities for conducting risk management activities within the operator's organization, include integrating risk management into existing functions where appropriate. Authority for decisions and necessary resources shall be defined.

1.1.3 The demonstration project shall describe the personnel qualifications necessary for the roles and responsibilities assigned and define the processes that will be used to ensure that personnel performing risk management tasks possess the necessary qualifications.

1.1.4 The demonstration project shall include management of change procedures.

1.1.5 The demonstration project shall contain an internal communications element, in which information concerning the goals and implementation of the risk management demonstration project, relevant input data, and results obtained are communicated throughout the organization.

1.1.6 The demonstration project shall contain an external communications element, in which regulator and other stakeholder interests and concerns are understood, and demonstration project objectives and results are communicated to and discussed with Federal, State, and local regulators, the public, and other stakeholders as appropriate.

1.1.7 A risk management demonstration project shall include a documentation plan that describes how the company will acquire, process, store, report, maintain, verify, and modify relevant risk management data and information (e.g. demonstration project plans and procedures, specific technical analyses with input data and assumptions, training records).
1.1.8 The risk management demonstration project shall include an evaluation plan that periodically examines and reports: 1) the quality and effectiveness of the administrative, communication, and documentation elements; 2) the quality and effectiveness of the analytical processes used to manage risks and monitor performance; 3) the choice of performance measures, and 4) the conclusions and reassessments about demonstration project effectiveness.

1.2 The risk management demonstration project includes a risk assessment process consistent with the Risk Management Program Standard.

1.2.1 The risk management demonstration project shall include a scope description that is consistent with the overall goals of the project, and that defines:

- The physical boundaries of the pipeline system that will be addressed within the demonstration project;

- The portions of the life cycle that will be addressed within the demonstration;

- The breadth of the analyses that will be addressed (e.g. will all types of failure modes and potential solutions be considered, or will the demonstration project focus on specific types of failure modes?).

- Key assumptions and constraints applicable to the system, the events, and the methods.

1.2.2 The scope of the demonstration project shall include system components and failure modes that have a significant effect on the risk management conclusions and decisions.

1.2.3 Any preliminary or screening analyses used to establish the scope of the demonstration project shall be defined and documented.

1.2.4 The demonstration project shall describe the processes, tools, and models by which pipeline incidents and their causes are identified.

1.2.5 The demonstration project shall describe the processes, tools, and models by which the frequency of pipeline failure events are estimated.

IV-9

January 1, 1997
1.2.6 The demonstration project shall describe the processes, tools, and models by which the consequences of pipeline failure events are estimated.

1.2.7 The level of detail and sophistication of the risk assessment processes and models shall be commensurate with the level of risk being evaluated and be able to provide the level of precision necessary to support the specific risk control decisions being made.

1.2.8 The sensitivity of the results of the risk assessment to uncertainties in model assumptions or data shall be determined.

1.3 The risk management demonstration project includes a risk control and decision-support process consistent with the Risk Management Program Standard.

1.3.1 Demonstration projects shall include formalized and structured processes to identify those specific situations where it may be possible to reduce risk (by reducing the likelihood of incidents, the consequences of incidents, or both), or to maintain risks at current levels in more cost-effective ways.

1.3.2 Demonstration projects shall include processes to produce an integrated set of potential risk control options, examining the possible conflicts and synergies between and among the individual risk control options identified above.

1.3.3 These integrative processes shall include an examination of the residual risk that would be expected to remain after the identified risk control options have been implemented and the consideration of additional risk control activities to address these residual risks.

1.3.4 Risk management demonstration projects shall include a process for evaluating and comparing the relative benefits of the risk control options being considered. The process shall explicitly describe:

- the factors being considered (e.g. risk-reduction to the public, risk-reduction to the environment, etc.)
- the algorithms for combining these factors (e.g. qualitative logic models, priority matrices, weighted benefit models, etc.).

1.3.5 The demonstration project shall describe the manner in which uncertainties in risk and other decision factors are addressed.
1.3.6 The methodologies used to combine benefits shall be compatible with company values and shall ensure that the values of regulators and external stakeholders are appropriately considered.

1.3.7 Risk management demonstration projects shall include a structured process by which management decides whether to take action.

1.4 The risk management demonstration project includes a performance measurement and feedback process consistent with the Risk Management Program Standard.

1.4.1 The demonstration project shall include a performance monitoring process that defines the performance measures selected, the manner and frequency in which data will be collected and the evaluation of performance against expected outcomes. In addition, the performance monitoring process shall evaluate the effectiveness of the specific program and process elements, and address appropriate improvements.

1.4.2 Applicable measures of performance shall be established and specified for the portion of the operator’s pipeline system within the risk management demonstration project. Selection of performance measures will depend on the expected outcomes of the risk management demonstration project, and shall reflect the selected risk control activities.

1.4.3 At a minimum, local performance measures shall meet the following criteria:

- Support the intent of the risk management initiative in achieving superior safety and environmental protection

- Are relevant to the risk control decisions being made in each demonstration project, and track their short-term and long-term effectiveness

- Document starting conditions, either through historical data, current physical data, new test data, or comparison with similar segments

- Establish expected outcomes from risk-control decisions in the form of discrete values or ranges for each measure
Enable auditing, monitoring, and documentation of performance.

1.4.4 Risk management demonstration projects shall identify precursor or anticipative performance measures that indicate activities or events affecting pipeline integrity with the potential to cause a release of product.

1.4.5 The performance monitoring process shall define the mechanisms that will be used to collect information on a pre-determined basis; monitor pipeline operating conditions, operating parameters, and physical condition; and track performance against the selected performance measures.

1.4.6 The performance monitoring process shall establish criteria indicating when adjustments to risk-control decisions within the risk management demonstration project can be made, or adjustments to the risk management demonstration project itself are required. The criteria should indicate whether regulator notification and/or approval would be required.
RC #2: The proposed risk management demonstration project is expected to produce superior safety, environmental protection, and reliability;

2.1 Each situation where the company proposes to implement an alternative safety practice to a current regulatory requirement is clearly defined in the company’s risk management demonstration project.

2.2 In each situation where the company proposes a safety alternative to a current regulation, the alternative is expected to produce an overall reduction in risk to the public, workers, the environment, and service availability considering all relevant failure modes and events that could be affected by the safety alternative.

2.3 In each situation where the company proposes a safety alternative to a current regulation or does away with redundant activities altogether, the overall system safety and environmental protection are safeguarded.

2.4 The manner in which the company combines the affects of safety alternatives on public health risk, worker risk, environmental risk, and service availability risk into an overall net risk impact to satisfy Review Criteria 2.2 is consistent with the generally accepted values of the affected population and practices of comparable industries.

Evaluation: Is it reasonable to expect that the proposed risk management demonstration project will result in superior safety, environmental protection, and reliability?

A. Yes ___

B. Requires Additional Information ___ (describe)

C. Does Not Address ___

D. No ___ (explain)
RC #3: The proposed risk management demonstration project includes a company work plan and a performance monitoring plan that will provide adequate assurance that superior safety and environmental protection is being achieved.

3.1 The application defines the major milestones associated with developing and implementing the risk management demonstration project

3.2 The application defines the specific times when any alternative safety practices will be initiated

3.3 The application documents the company’s performance monitoring plan, including the schedule for performing any tests, collecting any data, and performing any evaluations or inspections specified within the company’s performance monitoring plan

Evaluation: Does the proposed risk management demonstration project application include an adequate work plan and performance monitoring plan?

A. Yes ___

B. Requires Additional Information _____ (describe)

C. Does Not Address _____

D. Describes an Unacceptable Process or Outcome _____ (explain)
V. Establishing an OPS Audit Plan

Once OPS has approved a demonstration project and issues the operator a written order setting forth the terms and conditions for the operator’s participation in the demonstration program, OPS will develop an audit plan customized for each approved project. OPS will provide its audit plan to the participating operator.

V.1 Contents of the OPS Audit Plan

The OPS audit plan will describe the regulators’ expected level of effort in monitoring the demonstration, including the type of audits, their frequency, the participants, and the audit scope. Planned OPS audits would coincide with the operator’s data taking at key decision points, such as when the operator evaluates the effectiveness of safety activities or considers modifying safety activities.

This plan would not limit OPS’s statutory authority to inspect a pipeline facility during the period of the demonstration.

The audit plan will address, in an integrated manner, how OPS will ensure that the operating company:

1) develops and maintains an acceptable risk management program as defined by the Risk Management Program Standard, as agreed to in the approved demonstration project application, and reflected in the Order;

2) implements the alternative safety practices as agreed to in the approved demonstration project application and reflected in the Order;

3) complies with those applicable regulations either not affected by the demonstration project or committed to within it;

4) implements the company performance monitoring plan as agreed to in the approved demonstration project application, and reflected in the Order;

5) implements the company work plan as agreed to in the approved demonstration project application, and reflected in the Order.

V.2 Responsibility for Developing and Implementing the Audit Plan

The Project Review Team assigned to each demonstration project is responsible for developing the OPS audit plan for that project. The PRT may obtain input and assistance in the development of this plan from:
- OPS Regional inspectors
- OPS risk management staff
- Affected state regulators

The PRT is responsible for implementing the OPS audit, utilizing field inspectors, headquarters staff, and other support as required.
VI. Modifying an Approved Demonstration Project

It is expected that the originally approved demonstration projects will require changes during the demonstration period. There may be many reasons for either the operating company or the OPS to want to modify an approved demonstration project. For example:

- The company's experience and capabilities with risk management has grown and improved;
- the experience with the original project scope was successful, and there are opportunities to expand the scope and benefits of the project to other parts of the operating company's pipeline;
- new information is available that change the underlying assumptions or affect the analyses that led to the approval of the original demonstration project;
- the performance monitoring program or OPS audits indicate that modifications are necessary to assure superior levels of safety and environmental protection;
- the company is not, or finds itself incapable of implementing the demonstration project as approved;
- changes occur in the company ownership, management, or operation of the pipeline that would impact the company's ability or desire to continue the demonstration project as approved.

In fact, the expectation of controlled program expansion or modification may be discussed in the consultation process leading to the original approval. While change is expected, modifications to the demonstration projects will be made in a controlled, structured process to assure that the demonstration projects continue to assure superior levels of safety and environmental protection. Presented in the subsections are the specific processes, responsibilities, and criteria for modifying an approved risk management demonstration project.

VI.1 Protocols for Modifying an Approved Project

There are two basic steps in the modification process:

1) Notification of the need or desire to modify the project;
2) Review and approval of the modification.
VI.1.1 Initiating the Modification Process

Either the operating company or the OPS can initiate the modification process.

An operator notifies OPS of any intent to make substantive modifications to the risk management project once a demonstration is underway. If the company initiates the process, it does so through a formal letter to the OPS, signed by a responsible corporate manager. The letter of proposed modification would describe the proposed change to the Order, and provide the justification for the change.

The PRT decides if a company-initiated modification has the potential to serve better the overall objectives of the national demonstration program than the current, approved project. If so, the PRT either sends the proposed modification to the Associate Administrator for approval, or invites the company to a consultation to discuss the proposed modification. If the PRT decides that the proposed modification would not improve or expand the benefits of the demonstration project, it will notify the company and the existing Order will remain in effect.

If the OPS initiates the process, it does so through the PRT. If any member of the PRT, any member of OPS, or any of the affected state regulators believes that a modification in the demonstration project is necessary to assure superior levels of safety and environmental protection, the proposed modification and the reasons for it should be communicated to all members of the PRT. The PRT, as a group, decides if it is necessary to initiate a project modification process with the operating company.

If the PRT believes that a modification to an approved demonstration project may be necessary, the PRT notifies the company and initiates consultations with the company to discuss potential modifications.

VI.1.2 Review and Approval of Modifications

The process for review and approval of modifications is identical to that used for review and approval of the original application. At this point the PRT will be very familiar with the overall demonstration project and the review process will focus on the specific modifications.

After the OPS invites the company to a consultation to discuss the proposed modification, discussions identical to the original approval process are initiated. If the consultations and discussions result in a change to the approved demonstration project, the change is reflected in a revision to the Order issued by the OPS to the company. The same provisions will be made for public review and comment on renegotiated projects as were available for the original application.

It is possible that the discussions will lead to a decision to terminate, rather than modify the project. For a discussion of the termination process, see Section VII.
Throughout the modification process, OPS always retains its authority, through appropriate administrative action, to address any unsafe conditions that arise during the demonstration period to ensure that such conditions are quickly addressed.

VI.2 Responsibility for Modifying an Approved Project

Both the company and the OPS has the responsibility to identify and communicate the need for a modification required to assure superior safety and environmental protection. Specific responsibilities during the modification are as follows:

The Operating Company:

- Formally notifies the OPS of a need or desire to modify the project;
- Enters into consultations with the PRT;
- Provides justification to the PRT for the modifications, describing the additional benefits to be accrued by the modification, and providing the assurances that superior safety and environmental protection will continue to be achieved.

The Project Review Team

- Identifies any need for project modifications through its OPS Audit Plan;
- Reviews the proposed modifications;
- Enters into consultations and discussions with the operating company;
- Approves or rejects the modification.

OPS Risk Management Staff

- Supports the PRT, as needed, in the modification review and approval process;
- Includes documents and correspondence related to the modification in the Risk Management Information System;
- Ensures that information related to the proposed and approved modification is provided to local public safety officials and key stakeholders.
VI.3 Criteria for Modifying an Approved Project

In deciding whether to initiate the modification process, OPS uses the following criteria:

MC #1: New information has become available that indicates that the currently approved demonstration project, contrary to original expectations, is not achieving or will not achieve the objectives of the national demonstration program.

MC #2: New information has become available that, if available at the time of approval, would have materially affected the PRT's decision to approve the project.

MC #3: Modifications to the currently approved demonstration project could substantially improve the ability of the project to support the objectives of the national demonstration program.

In deciding whether to approve the modification, OPS uses the same review criteria used in the original approval process:

RC #1: The proposed risk management demonstration project is consistent with the Risk Management Program Standard and compatible with the Guiding Principles set forth in that Standard;

RC #2: The proposed risk management demonstration project is expected to produce superior safety, environmental protection, and reliability;

RC #3: The proposed risk management demonstration project includes a company work plan and a performance monitoring plan that will provide adequate assurance that superior safety and environmental protection is being achieved.
VII. Terminating an Approved Demonstration Project

During the demonstration period, it may necessary or desirable to terminate an approved risk management demonstration project. Termination of an approved demonstration project will be made in a controlled, structured process to maintain safety and environmental protection, and to assure fairness to the company. Presented in the subsections are the specific processes, responsibilities, and criteria for terminating an approved risk management demonstration project.

The need and processes for terminating demonstration projects after the completion of the demonstration period will depend upon the results of the demonstration program, and are not addressed in this document.

VII.1 Protocols for Terminating an Approved Project

There are three basic steps in the termination process:

1) Notification of the need or desire to terminate the project;

2) Review and decision of whether to terminate the project;

3) Establishment of the conditions of termination, including definitions of acceptable compliance with existing regulations.

VII.1.1 Initiating the Termination Process

Either the operating company or the OPS can initiate the termination process.

Although the operating company’s original Letter of Intent includes a commitment for the duration of the demonstration program, significant events may occur that would warrant the company’s desire to terminate the project. For example, the company may discover that the safety alternatives it proposed cannot be implemented in a manner that provides superior safety and environmental protection. If the company initiates the termination process, it does so through a formal letter to the OPS, signed by a responsible corporate manager. The letter of proposed termination describes the reason for the termination, and proposes how the company will comply with current regulations.

The PRT evaluates a company-initiated proposal for termination. The PRT either directly forwards the proposal for termination to the Associate Administrator, or invites the company to a consultation to discuss the termination. If the PRT decides that the proposed termination is not acceptable, it will notify the company and the existing Order will remain in effect.
If OPS initiates the termination process, it does so through the PRT. OPS may decide to initiate termination proceedings if it believes:

1) the operator is not complying with the terms and conditions of the approved risk management project;

2) safety or environmental protection has been compromised because of actions taken as a result of the current demonstration.

If any member of the PRT, any member of OPS, or any of the affected state regulators believes that a termination of the demonstration project is necessary, this should be communicated to all members of the PRT. The PRT, as a group, decides if it is necessary to initiate a project termination process with the operating company.

If the PRT believes that a termination of an approved demonstration project may be necessary, the PRT notifies the company and initiates consultations with the company.

VII.1.2 Review and Approval of Terminations

The process for review and approval of terminations is identical to that used for review and approval of the original application, and for modification of the project.

After the OPS invites the company to a consultation to discuss the proposed termination, discussions identical to the original approval process are initiated. If these consultations result in a PRT decision that the proposed termination is not acceptable, it will notify the company and the existing Order will remain in effect. If these consultations result in a decision to terminate an approved demonstration project, the conditions of this termination are then negotiated.

The conditions for termination address the requirements for compliance with existing regulations in areas where the company was implementing approved alternative safety practices as part of the risk management demonstration project prior to termination. The PRT decides whether company can continue to perform the alternative safety practices approved under the demonstration project in lieu of specified regulations, or whether the company must revert (through a mutually agreed upon transition process) to full compliance with existing regulations after termination of the demonstration project. PRT decisions will be reflected in an Order issued to the company.

Throughout the termination process, OPS always retains its authority, through appropriate administrative action, to address any unsafe conditions that arise during the demonstration period to ensure that such conditions are quickly addressed.
VII.2 Responsibility for Terminating an Approved Project

Both the company and the OPS has the responsibility to identify and communicate the need to terminate a demonstration project to assure superior safety and environmental protection. Specific responsibilities during the termination process are as follows:

**The Operating Company:**

- Formally notifies the OPS of a need or desire to terminate the project;
- Enters into consultations with the PRT.

**The Project Review Team**

- Identifies any need for project termination through its OPS Audit Plan or other performance monitoring mechanisms;
- Reviews company proposals for termination;
- Enters into consultations and discussions with the operating company;
- Evaluates the need for termination;
- Establishes conditions for termination.

**Associate Administrator, Office of Pipeline Safety**

- Review of PRT evaluations;
- Makes decision to terminate.

**OPS Risk Management Staff**

- Supports the PRT, as needed, in the termination review and decision process;
- Includes documents and correspondence related to the termination in the Risk Management Information System;
- Provides information related to the termination to local public safety officials.
VII.3 Criteria for Terminating an Approved Project

In deciding whether to initiate the termination process, OPS uses the following criteria:

TC #1: New information has become available that indicates that the currently approved demonstration project, contrary to original expectations, can not achieve, and cannot be modified to achieve, the objectives of the national demonstration program.

TC #2: New information has become available that, if available at the time of approval, would have resulted in the PRT's rejection of the original application.

In deciding whether to approve the termination, OPS uses the same review criteria used in the original approval process:

RC #1: The proposed risk management demonstration project is consistent with the Risk Management Program Standard and compatible with the Guiding Principles set forth in that Standard;

RC #2: The proposed risk management demonstration project is expected to produce superior safety, environmental protection, and reliability;

RC #3: The proposed risk management demonstration project includes a company work plan and a performance monitoring plan that will provide adequate assurance that superior safety and environmental protection is being achieved.
Summary of Criteria

Screening Criteria

SC #1. (Mandatory) The Letter of Intent shall provide the information required in the Federal Register Notice, and shall demonstrate that the company is eligible to participate in the pipeline risk management demonstration program.

SC #2. (Mandatory) The Letter of Intent shall provide reasonable evidence that the operating company is committed to and capable of developing and implementing a demonstration project that will produce superior safety and environmental protection.

SC #3. (Mandatory) The company's past and current safety and compliance performance shall provide confidence that the company is dedicated to the achievement of superior safety and environmental protection.

SC #4. (Relative) The company intends to implement a risk management demonstration project that, relative to other proposed demonstration projects, will help OPS achieve the objectives of the demonstration program.

Review Criteria

RC #1: The proposed risk management demonstration project is consistent with the Risk Management Program Standard and compatible with the Guiding Principles set forth in that Standard;

RC #2: The proposed risk management demonstration project is expected to produce superior safety, environmental protection, and reliability;

RC #3: The proposed risk management demonstration project includes a company work plan and a performance monitoring plan that will provide adequate assurance that superior safety and environmental protection is being achieved.

January 1, 1997
Modification Criteria

MC #1: New information has become available that indicates that the currently approved demonstration project, contrary to original expectations, is not achieving or will not achieve the objectives of the national demonstration program.

MC #2: New information has become available that, if available at the time of approval, would have materially affected the PRT's decision to approve the project.

MC #3: Modifications to the currently approved demonstration project could substantially improve the ability of the project to support the objectives of the national demonstration program.

Termination Criteria

TC #1: New information has become available that indicates that the currently approved demonstration project, contrary to original expectations, can not achieve, and cannot be modified to achieve, the objectives of the national demonstration program.

TC #2: New information has become available that, if available at the time of approval, would have resulted in the PRT's rejection of the original application.

January 1, 1997
Prototypes
to Illustrate the
Risk Management Demonstration Process
The Demonstration Process

**Company**
- Submits non-binding LOI, indicating interest
- Discusses risk management program with OPS staff
- Discusses risk management program with PRT
- Submits official application reflecting consultations
- Implements company’s approved performance monitoring plan
- Identifies modifications to maximize benefits and assure safety

**OPS**
- Selects best potential applicants and invites to consultations
- OPS staff meets on-site with company and then briefs PRT
- PRT discusses proposed project with company
- PRT reviews against criteria, provides results of evaluation for approval
- Implements OPS Audit Plan
- Identifies, evaluates, and approves modifications to maximize benefits and assure safety
Prototypes to Illustrate the Demonstration Process

The Demonstration Project
Review and Approval Process

Illustrative Examples Using Prototypes of Gas and Liquid Risk Management Demonstration Projects

The Demonstration Process

<table>
<thead>
<tr>
<th>Company</th>
<th>OPS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Solicits non-binding LOL, indicating interest</td>
<td>Solicits tour potential applicant and submits it to committee</td>
</tr>
<tr>
<td>Discuses risk management program with OPS staff</td>
<td>OPS staff meets with risk management team and their local PET</td>
</tr>
<tr>
<td>Discuses risk management program with PET</td>
<td>PET discusses proposed project with company</td>
</tr>
<tr>
<td>Submits official application, releasing spreadsheet</td>
<td>PET reviews against criteria, provides rationale for rejection or approval</td>
</tr>
<tr>
<td>Implements company's approved performance monitoring plan</td>
<td>Implements OPS Audit Plan</td>
</tr>
<tr>
<td>Identifies modifications or minimizes impacts and ensures safety</td>
<td>Identifies, evaluates, and approves modifications to minimize impacts and ensure safety</td>
</tr>
</tbody>
</table>

Characteristics of the Process

- Structured but flexible
- Ensures “Regulated Risk Management” with OPS in control at all decision points
- Accountability built-in from the start
- Promotes interaction, discussion, openness, and communication
The Letter of Intent

• Informs OPS about the company's proposed demonstration project
• Provides sufficient information for screening
• Satisfies guidelines on LOI content in the Program Framework and the Program Standard

LOI Content

• Scope of the Demonstration Project
  - Physical boundaries
  - Breadth of Analysis
  - Potential for Expansion of Scope
• System Profile
  - Pipe size, age, and material
  - Population Distributions
  - Geographic conditions

LOI Content (continued)

• Alternative or additional safety practices
• Affected regulations
• Means of and commitment to complying with the Program Standard
• Means of communicating with local officials
The Screening Process

Purpose: Enables OPS to select demo projects best serving the objectives of the demonstration program.

OPS Screening Considerations

• Achieving enough diversity among demo projects to test RM as a regulatory alternative in a variety of situations
• Selecting companies dedicated to using RM for superior safety and environmental protection

Positive LOI Attributes

• Shows distinguishing features of demo
• Describes expansion possibilities
• Shows company commitment
• Describes communications plan

January 15, 1997
The Consultation Process

- Pre-consultations optimize efficiency
- Face-to-face interactions involve the company and an OPS Project Review Team
- Follow-on discussions (if needed) refine demo project provisions
- A successful consultation process facilitates formal application and project approval

The Project Review Team

- Composed of OPS Personnel
- Supported by input from:
  - OPS HQ and Region staff
  - Affected State Pipeline Safety Regulators
  - RM Contractors

Three Primary Evaluation Criteria

- The company's RM program is consistent with the Program Standard
- The demonstration project will reduce risk and produce superior safety and environmental performance
- The company has a practical work plan and performance monitoring plan
The Pre-Consultation

Purpose: To prepare the PRT and the company for an efficient consultation:
- verify and expand on LOI
- examine company's RM program & process elements
- clarify proposed risk control activities, especially alternatives to existing regulations
- flag possible areas for PRT discussion
- address consultation logistics issues

Gas Company Presentation at Pre-Consultation

- Proposed Project Scope
- Proposed Alternatives
- Technical Basis for Superior Performance
- RM Program
- Performance Measures

Pre-Consultation Report to the PRT

- OPS RM staff & support contractors met with Natural Gas Company (NAGCO) at the corporate offices
- NAGCO presented additional information and answered OPS questions on:
  - its proposed demo project
  - its RM program and process descriptions
- Discussions were open, questions addressed, and issues for PRT attention identified

January 15, 1997
Issues for PRT Attention

- OPS Access to Inspection Data
- Training Program Improvements
- Provision for Automatic Approvals of Expanded Scope
- Audit Plan

Additional Areas Raised by PRT

Before the consultation, OPS RM staff briefed the company on PRT issues:
- Performance Measures
- Specific Criteria for Expansion
- Specifics of Damage Prevention
- Specifics of Audit Plan

Gas Company Presentation to PRT

- Proposed Project Scope
- Proposed Alternatives
- Technical Basis for Superior Performance
- Response to Pre-Consultation Issues
- Discussion of PRT Issues
Gas System Profile

- Natural gas transmission
- 5000 mile system
- System generally 30 years old
- 20", X60, 0.256 wt, SAW seams
- MAOP 850 psig
- Hydrotreated to 953 psig in 1968
- Coating is mill applied coal tar enamel

Additional information is available in the Gas Company Information Sheet provided by the company.

Proposed Regulatory Alternatives

- Class location change from 2 to 3 in a 10,000 ft segment
  requires pipe replacement per regulation
- Proposed Alternative:
  - Internal inspection of 90 mile segment
  - Re-inspect in 15 years
  - Remediate all anomalies that impact MAOP
  - Increase patrolling [every two months]
  - Increase efforts in damage prevention
- Initial Scope is a specific 10,000 ft. segment (see map)
- Proposed plan for expanding scope

Gas Company Map
Rationale for Alternative

- Added risk is small, but must be addressed
- Risk-reduction associated with the pipe replacement is correspondingly small
- Risk managed more efficiently by alternatives
- Proposed alternatives decrease the likelihood of pipeline failure and provide new safety information
- Proposed safety alternatives reduce overall risk

Proposed Local Performance Measures

- Compare anomalies in 88 miles against any in Class Location
- Compare leaks [by cause] in 88 miles against any in Class Location
- Compare third party damage incidents in 88 miles against any in Class Location
- Compare patrol findings in 88 miles against any in Class Location

Discussion of Performance Measures

- Anomalies
- Leaks
- Damage Prevention
Discussion of Data Access

- Proprietary or Sensitive
- Access at company site
- Relevance to Class Location
- Pigging Contractor Reports

Discussion of Scope Expansion

- Approval of process
- Who approves expansion
- How long for approval
- Additional information required

Damage Prevention Program

- Focus on new construction utilities
- Expanded advertising for One-Call System
- Improved locating / marking in construction areas
Discussion of Damage Prevention Program

- Third party damage
- Specifics of damage prevention program
- Performance Measurement

PRT Conclusion

- Proposed alternatives and technical basis are adequate
- NAGCO will provide on-site access to all internal inspection data for 90 mile segment
- NAGCO will implement training program
- Each scope expansion requires PRT pre-approval
- NAGCO application reflects all consultation agreements

Liquid Company Presentation at Pre-Consultation

- Proposed Project Scope
- Proposed Alternatives
- Technical Basis for Superior Performance
- RM Program
- Performance Measures

January 15, 1997
Pre-Consultation Report to the PRT

- OPS RM staff & support contractors met with Liquid Company at the corporate offices
- Liquid Company presented additional information and answered OPS questions on
  - its proposed demo project
  - its RM program and process descriptions
- Discussions were open, questions addressed, and issues for PRT attention identified

Issues for PRT Attention

- Communication program improvements
- National vs. pipeline-specific data

Additional Issues Raised by PRT

Before the consultation, OPS RM staff briefs the company on PRT issues:
- Technical interest in rattle vaults
- Specifics of internal inspection tools and strategies
Liquid Company Presentation to
PRT

- Proposed Project Scope
- Proposed Alternatives
- Technical Basis for Superior Performance
- Response to Pre-Consultation Issues
- Discussion of PRT Issues

Liquid System Profile

- Refined products (Diesel, Jet A fuels) transmission
- 48 mile segment entirely in Nevada (see Map)
- Constructed in 1962, purchased by Liquid Company in 1972; no recorded hydrotest
- ERW, 8.625" diameter, 0.188" wall thickness
- SMYS = 42,000 psi
- Rectified impressed current CP, with coal-tar enamel coating
- SCADA with leak detection capability
- Can accommodate internal inspection devices

Additional information is available in the Liquid Company Information Sheet provided by the company.

Map of Demo Site

Terminal
Reservoir
Pump Station

River
Creek
Dan Dorn
boundary

January 15, 1997
Proposed Risk Control Activities

There are two major outcomes of the Liquid Company's risk management program that are noteworthy:

1) Their risk analysis has uncovered a source of risk that wasn't being addressed under the current regulatory compliance scheme, and they are planning to apply some innovative technologies to address this risk;

2) Proposal to conduct instrumented internal inspection in place of hydrostatic testing.

Discovered Risks

- Potential for landslide or earthquake to damage pipe resulting in release of product into local drinking water source
- Company looked at many risk control options and selected a combination of:
  - Installation of "motor operators" on existing manual block valves
  - Installation of "rattle-vaults"

Risk Basis for Selected Actions

- Rattle vaults reduce probability of failure due to earthquake
- Rattle vaults mitigate consequences of a release
- Motor operators allow faster response time, reducing expected drain-down volume
Internal Inspection Strategy

- Geometry tool
- Instrumented internal inspection reconsidered every 10 years
- Correlate data with close-interval survey
- Repair where anomalies impact MOP

Risk Basis for Alternative

- Hydrotesting detects all current anomalies but...
- Smart pig inspection will provide significant information, but...
- The overall likelihood of an incident due to an undetected and unrepaird anomaly is less with the inspection strategy than with the hydrotest.

Proposed Local Performance Measures

- Number of anomalies requiring repair found during inspections
- Percentage of time SCADA operating
- Number of third party encounters
- Number of public education meetings held annually with audience and message
- Earthquake impacts on “rattle vaults”
Discussion of Performance Measures

- Repair criteria
- Definition of SCADA reliability
- Anticipated third party activity
- Public education audiences

Discussion of Internal Inspection Strategies

- Follow-up inspection
- Close interval survey impacts
- Type of smart pig to be used

Discussion of National vs. Pipeline-Specific Data

- Known pipe characteristics
- Differences in data
- Applicability of national data
Discussion of Communication Program

- Define audience groups
- Define message

Discussion of Regulators' Audit Plan

- Who on PRT conducts audits
- What is audited by PRT
- When PRT should be notified
  - Pipeline releases/accidents
  - Performance measure variations
- Workplan activities PRT would like to be present for

PRT Conclusion

- Proposed alternatives and technical basis are adequate
- Liquid Company will use company-specific data where they deem appropriate, but will continue to perform sensitivity studies
- Liquid Company will hydrotreat a similar segment where water disposal is not burdensome
- Liquid Company will implement the agreed-to Communications Program
- Liquid Company application reflects these and other consultation agreements
Characteristics of the Process

- Structured but flexible
- Ensures "Regulated Risk Management" with OPS in control at all decision points
- Accountability built-in from the start
- Promotes interaction, discussion, openness, and communication

The Demonstration Process

| Company                          | OPS
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Scheme over-arching UGI</td>
<td>Scheme but potential applicants and invest in consultations</td>
</tr>
<tr>
<td>indicating structure</td>
<td>OPS staff review works with company and then submit PFT</td>
</tr>
<tr>
<td>Detailed risk management program with OPS staff</td>
<td>PFT discusses proposed project with company</td>
</tr>
<tr>
<td>Detailed risk management program with PFT</td>
<td>PFT reviews against criteria, provides results of evaluation for approval</td>
</tr>
<tr>
<td>Scheme official application - refining specifications</td>
<td>Implements OPS Audit Plan</td>
</tr>
<tr>
<td>Implement company's approved performance monitoring plan</td>
<td>Identifies, evaluates, and approves modifications in measures benefits and ensures safety</td>
</tr>
<tr>
<td>Identify milestones to measure benefits and ensure safety</td>
<td></td>
</tr>
</tbody>
</table>

17

January 15, 1997
**PIPELINE DATA SHEET FOR NAGCO DEMONSTRATION PROJECT**

<table>
<thead>
<tr>
<th>Segment Length/Location</th>
<th>Manufacturer</th>
<th>Date Commissioned/Age</th>
</tr>
</thead>
<tbody>
<tr>
<td>90 miles in rural Missouri</td>
<td>Republic</td>
<td>December, 1968 28 years old</td>
</tr>
<tr>
<td>Longitudinal Seam Weld</td>
<td>Current MAOP/Class Location</td>
<td>Last Hydrotest/Pressure</td>
</tr>
<tr>
<td>Submerged Arc Welding</td>
<td>709 psig Class 2</td>
<td>December, 1968 953 psig</td>
</tr>
<tr>
<td>External Coating Type/Age</td>
<td>Internal Coating Type/Age</td>
<td>Pipe Type/Grade</td>
</tr>
<tr>
<td>Mill-applied coal tar enamel</td>
<td>None</td>
<td>26 inch outside diameter X60</td>
</tr>
<tr>
<td>28 years old</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Wall Thickness</td>
<td>Pressure to Produce 100% SMYS</td>
<td>MAOP for Class Location</td>
</tr>
<tr>
<td>0.256 inches</td>
<td>1182 psig</td>
<td>Class 1: 850 psig Class 2: 709 psig Class 3: 590 psig Class 4: 472 psig</td>
</tr>
<tr>
<td>Length</td>
<td>Compressor Station Locations</td>
<td>Cathodic Protection System</td>
</tr>
<tr>
<td>90 miles (Class change in 10,000 foot section)</td>
<td>At each end of 90 miles</td>
<td>Impressed current, graphite anodes and rectifiers</td>
</tr>
<tr>
<td>Soil Type</td>
<td>Class Location Change</td>
<td></td>
</tr>
<tr>
<td>Close to neutral pH</td>
<td>Due to addition of four houses in a subdivision</td>
<td></td>
</tr>
</tbody>
</table>

January 15, 1997
LETTER OF INTENT
TO CONDUCT A RISK MANAGEMENT DEMONSTRATION PROJECT

SAMPLE

NAGCO intends to conduct a risk management demonstration project on their natural gas interstate pipeline system at a location described below. NAGCO operates a 5,000 mile system in five states and the segment proposed for a demonstration project is typical of the pipe type and age found system wide. The project will be conducted in accordance with guidance from the Interim Program Standard and Guidelines for Performance Measures. The segment is jurisdictional to and inspected by the federal government.

The demonstration project will be conducted on a 10,000 foot segment between CS1 and CS2 and the line is described on the attached information sheet. The regulatory alternative is for relief from the MAOP reduction or pipe replacement required due to a change in Class Location from Class 2 to 3 due to the addition of four new homes in the latest house count for the area. NAGCO intends to run an instrumented pig, perform additional patrolling and enhance their damage prevention program for that area instead of replacing pipe.

NAGCO has an existing risk management program for making risk based business decisions. We feel the existing program meets the guidelines in the process framework and Interim Program Standard. The risk controls listed above have been analyzed by NAGCO and are capable of providing superior safety for the Class Location in the demonstration project. The performance measures proposed for the demonstration project follow the criteria from the Guidelines for Performance Measures.

In general, NAGCO will provide superior safety for the Class Location by the actions listed above and will maintain these risk controls throughout the four year demonstration period. NAGCO intends to extend the demonstration technique to additional Class Locations over the four year demonstration period and will work with the Project Review Team on the proposed extensions.

NAGCO is aware of the requirement for communicating with national, state and local stakeholders regarding the advantages and differences in the application of risk management to pipeline operation and maintenance. We have a communications plan to address these issues which will be presented to the Project Review Team should our project be selected.

NAGCO is looking forward to working with the Office of Pipeline Safety during the demonstration period and will furnish additional information if needed to clarify the Letter of Intent.

Vice President, Operations

January 15, 1997
Additional Information

Addresses and contact numbers.

To comment or ask questions, write or call:

NAGCO contact.
OPS contact.
State contact.
Features of Proposed Risk Management Demonstration Project

NAGCO is proposing, through the USDOT Office of Pipeline Safety, a risk management demonstration project near Everytown, MO. The demonstration project will include the following:

- **Project description** - the line segment is an existing 10,000 feet of pipeline in a relatively densely populated area in the Newhouse Subdivision of Everytown, MO.
- **Benefits** - NAGCOs risk management project will provide superior safety to the 10,000 foot pipeline segment.
- **Contacts** - for additional information regarding the demonstration project contact:
  NAGCO Contact
  OPS Contact
  State Contact

Project Specifics

NAGCO has a pipeline segment which has changed Class Location from 2 to 3 due to the addition of four houses in the Newhouse Subdivision. Current pipeline safety regulations would require NAGCO to replace the 10,000 feet with heavier pipe or reduce operating pressure.

Under the risk management demonstration project, NAGCO will run an instrumented internal inspection tool to determine the condition of the line, they will increase surface patrolling of the line segment and enhance their existing damage prevention program.

The USDOT Office of Pipeline Safety has tentatively selected the NAGCO risk management demonstration project. Approval will be granted only after an in-depth review of the operators safety and reliability records; a technical analysis of the proposed alternative to the regulations review of training, communications and performance measures relating to the proposed project.

Public Participation is Solicited

This information is being provided to make sure that all parties that could be affected by this risk management demonstration project have the opportunity to comment on the proposed risk management demonstration project. Questions or comments regarding the risk management demonstration project can be directed to the contacts listed in this brochure.
Survey of Regulatory Agency Applications of Risk Management

Executive Summary

1. Objectives and Approach

This report summarizes the results of a survey of current regulatory and industry applications of risk management. The survey was conducted in support of the Office of Pipeline Safety (OPS), Research and Special Programs Administration (RSPA), U.S. Department of Transportation (DOT). The objectives of this survey were:

- To place the intended OPS regulatory application of risk management in perspective relative to uses of risk management by other regulatory agencies;

- To assess whether the OPS approach has recognized and addressed criticisms of other regulatory risk management programs; and

- To develop lessons on how OPS should proceed based on the experience of others.

The approach taken involved assembly of information from literature reviews and from interaction with regulatory agencies and companies. Fifteen programs implemented at seven agencies were reviewed (see Attachment 1). There was, however, no attempt to be comprehensive. The intent was to assemble good examples and lessons, both positive and negative, learned by agencies in their development and application of risk management.

2. Overall Conclusions

Risk management is drawing increasing attention as a fundamental ingredient in the regulation of health, safety and the environment. Risk management programs of various types are being pursued by many government agencies. The benefits produced by these programs have, however, been inconsistent. Some programs have achieved demonstrably increased safety (both anticipated as a result of improved practices and demonstrated through improved performance), while others have had little real impact on industry performance.

The objectives, design, and implementation time frame of the OPS risk management program are consistent with those of the other agency programs surveyed. Because OPS has formulated its program drawing on available experience to support design and validation, it has developed a program that incorporates the useful features and that addresses the negative features of other agency programs. Thereby, OPS has positioned itself at the leading edge of risk management programs. Throughout the duration of the Pipeline Risk Management Demonstration Program, OPS will continue to interact with other agencies so that additional lessons are recognized and integrated into its program.

January 15, 1997
3. Lessons Learned From Other Regulatory Risk Management Programs

The lessons from regulatory agency risk management programs surveyed are summarized below. These lessons are categorized according to topics of potential interest to OPS. First, lessons related to the strategic and policy aspects of risk management programs are presented, followed by lessons related to the design and implementation of these programs. Some lessons are further illustrated using a subjective scale on which the relative position of each program surveyed is depicted along with the position of the current OPS program. The agency/program abbreviations used on these scales are shown on Attachment 1. More detailed information on these other agency programs, including support for the relative position of these programs on each scale, is available the main report.

3.1 Program Strategic and Policy Lessons

1. **Level of Program Acceptance:** Risk management is drawing increasing attention as a fundamental ingredient in the regulation of health, safety and the environment. This attention, together with increased pilot activity to demonstrate program value, has been promoted through bi-partisan support from Congress and from the Clinton Administration’s “Re-Inventing Government” initiative.

2. **Program Maturity:** The majority of agency programs surveyed were in the early stages of implementation. Therefore, lessons were primarily related to program design and initial pilot or demonstration program experience. Even the more mature programs; that is those having well developed features including formalized standards, program review guidance, training, and measures of performance -- such as the NRC Risk-Informed Regulation Program; continue to evolve as experience is gained and incorporated.

3. **Acceptance Within the Agency:** Conditions associated with ultimate acceptance of risk management within the agency include:

   - Upper agency management must visibly demonstrate an ongoing high level of support for the program.
   - Professionals and managers across the agency must be appropriately involved in development and refinement of the program.
   - The role of agency field people must be clear. Field people in other agencies typically continue in their historic roles and often, in addition, assist in risk management program development and implementation. For example, OSHA field people have dual assignments in compliance assessment and risk management program evaluation; and an NRC Regional Administrator took the initiative to integrate risk management in inspection protocols.
Agency managers should expect that a long time will be required for broad internal acceptance of the program.

A scale depicting the degree of internal agency acceptance of risk management programs is presented below. As shown, the OPS program realistically expects a slow internal evolution toward program acceptance, and in undertaking means to attain this acceptance.

**Degree of Internal Agency Acceptance of the Risk Management Program**

- **Broad Acceptance**
  - [Coast Guard PTP, NRC Risk Informed Regulation]

- **Emerging, Project-Specific**
  - [OSHA VPP, EPA ELP, EPA CSI, EPA Project "XL"]

- **Narrow, Slow to Evolve**
  - [All Other Progs]

- **OPS**

4. **Program Benefits:** Benefits experienced with risk management programs include:

- Increased agency understanding of how companies operate and of the impact of agency actions and rules, allowing regulators to be more effective in their interactions with the companies,

- Increased mutual trust between regulators and companies, allowing interactions to be more open and efficient, and promoting a greater transfer of information (both formally and informally),

- Improved industry performance,

- Improvement and integration of regulations,

- Increased operating discretion for companies, allowing more cost-effective means to address company-specific risk issues and operating conditions

- Improved agency access to company performance information

- Industry knowledge has been demonstrably applied to attain regulatory objectives of improved safety, health and environmental performance.
Scales depicting selected benefits gained by other agencies and companies participating in risk management are shown below. Benefits have accrued to regulated entities through the responsible and controlled application of operator discretion. Agency benefits in the form of an improved regulatory framework are summarized under Lesson 6.

Operator Discretion in Modifying Existing Requirements

- Traditional Compliance Approach [OSHA VPP, EPA CAA/RMP, NJ TCPA]
- Case-By-Case Discretion [NRC Risk-Informed Reg., Coast Guard PTP]
- R.M. Program Defined Discretion [EPA Proj. "XL", EPA ELP, EPA CSI, Del IDPP]
- OPS

5. **Conditions for Program Success:** Conditions associated with ultimate program success include:

   - Where programs have experienced success, recognized benefits have accrued to both the regulatory agency and participating companies, and costs have been consistent with benefits derived,
   - The risk management demonstrations must consider the drivers that motivate industry participation and the barriers that impede it,
   - Industry acceptance has been improved by a demonstration phase that involves volunteers rather than conscripted participants,
   - All regulatory participants must understand their role in risk management,
   - Continued involvement by representatives of the regulated industry during design and demonstration phases will serve to promote program effectiveness,
   - Companies adopting risk management must effectively integrate program results and insights into operational decisions and the management of operations,

6. **Relationship to Existing Regulatory Programs:** Successful risk management programs complement existing regulatory programs (e.g., not all decisions are risk-based, and agencies continue performance reviews and program audits).
The scale presented below shows that, as OPS intends, other agencies have used risk management to affect improvements in their regulatory programs, and to support the development of innovative compliance strategies.

**Impact of the Risk Management Program on the Regulatory Framework**

- **Provide Reg. Alternatives**
  - [EPA Project "XL", NRC Risk-Informed Tech Specs]

- **Inform Reg. Programs**
  - [NRC Severe Accident Policy; EPA CSI; Coast Guard PTP; State Programs in NJ, Del & Cal]

- **Develop Alternative Compl. Strategies**
  - [EPA ELP, OSHA VPP, EPA CAA/RMP, NRC SEP]

- **OPS**

7. **Legal Basis:** Clear legal and procedural bases are needed for program success. These bases protect both the agency and participating companies, and they are important for the credibility of the program. Authority for OPS to conduct the risk management demonstration projects is contained in the Accountable Pipeline Safety and Partnership Act of 1996.

Scales depicting the initiators for agency risk management programs and the authority used to establish the programs are shown below. As shown, the OPS approach of collaboration with the industry in program initiation is consistent with other successful programs, and the authorization of the OPS program by statute is a safe posture.

**Initiation of Regulatory Risk Management Programs**

- **Statutory Mandate**
  - [EPA CAA/RMP, NJ TCPA, Cal RMPP]

- **External Policy Directive**
  - [EPA Project "XL", EPA Common Sense, EPA ELP]

- **Agency/Industry Initiative**
  - [NRC Risk-Informed Reg, Del IDPP, NJ TCPP, OSHA VPP, Coast Guard PTP]

- **OPS**

January 15, 1997
3.2 Program Design and Implementation Lessons

1. **Performance Measurement:** Quantitative measurement of performance represents one way to assess whether superior public safety and environmental protection results from risk management. Superior protection can also be assessed through a structured, expert-based process, rather than a quantitative, model-based process, while still maintaining adequate traceability and accountability. Good examples exist of subjective evaluation of program effectiveness (e.g., in the NRC Systematic Assessment of Licensee Performance [SALP]), in which expert judgement applied to integrate diverse evidence of safety improvement, plays a key role in defining acceptable changes in performance. NRC experience with its quantitative safety goal, on the other hand, has demonstrated that absolute, quantitative criteria are difficult to define, and may inappropriately focus the debate on subtleties of the analysis rather than on real safety questions. Other lessons related to the measurement of risk management program performance include:

- Traditional measures (e.g., the number of injuries and illnesses for OSHA) can be used as a proxy for program effectiveness when such events occur at a statistically-significant rate over the life of the program,

- New program-specific measures should be developed that directly correspond to specific project applications,

- Agencies have begun to evaluate the process used by companies to manage risks and to base judgements concerning the likely impact on performance on the effectiveness of the design and implementation of these processes,

- Agencies are encouraging or requiring company self assessments of process effectiveness and are making internal use of the results of these self assessments.

A scale describing the relationship of the OPS program to other agency programs relative to the use of program success measures is presented below. As shown, the OPS position in which project-specific objectives are used initially and ultimately support evolutionary development of effective measures of performance is consistent with agency practice.

January 15, 1997
Risk Management Program Success Measures

2. **Staffing Impacts:** Agency managers should expect that staffing will be impacted, and plan to use internal development, reassignment and new hires as appropriate. Agency staff needs access to risk management expertise and opportunities for personal development to assure their productive contribution to the program. Staff training developed and implemented in collaboration with industry has been successfully used by other agencies.

Scales related to the staff requirements, development and techniques for supplementing staff are shown below.

**Impact of Risk Management on Agency Staffing Requirements**

**Mechanisms for Supplementing In-House Staff**

January 15, 1997
Mechanisms for Developing Staff Expertise

- Internal Agency Training
  [NRC, Coast Guard PTP]

- Training Cooperatively with Industry
  [EPA ELP, OSHA VPP]

- Ad Hoc Development
  [Other EPA Programs]

OPS

3. **Access to Performance Data**: Agency managers should expect potentially significant changes in the type and volume of data received from industry in support of the program. They must consider changes to staff assignments and staff size to address these new and expanded data sources.

A scale depicting expectations for changes in the type and nature of data to support agency risk management programs is shown below. As shown, OPS expects both increased data from regulated companies and a need to overhaul the agency data infrastructure in support of its risk management program.

**Magnitude of Change to Data Infrastructure Within Agency**

- Overhaul Data Infrastructure
  [NJ TCPA, Del IDPP, Coast Guard PTP]

- Increased Data Required
  [NRC Risk-Informed Regulation, OSHA VPP, EPA CAA/RMP]

- No Change Apparent

OPS

4. **Communications**: In demonstration programs, communication activities are typically the responsibility of the operating company, and are more narrowly focused on program participants and constituents. Communications intended to secure broad-based acceptance of the programs typically involve traditional mechanisms such as opportunities for public comment on Federal Register Notices. In addition to these features, the OPS is encouraging local officials as well as the public to provide comments during the selection of demonstration project participants.

Scales related to agency program design regarding the role of stakeholders are shown below. As shown, OPS is moving toward a formal external communication program and is appropriately involving stakeholders in both program design and implementation.
4. Other Topics of Potential Interest to OPS Managers

1. **Agency Response to Accident or Violation**: Agencies typically revert to normal compliance practices given an accident or violation. Under these conditions an agency must participate in cause determination and react consistent with what they learn. OSHA exhibits no difference in their response to accidents for facilities in the Voluntary Protection Program (VPP). EPA Environmental Leadership Program rewards self disclosure by granting a penalty-free 90 day period to correct the deficiency. If the mutual trust relationship isn’t breached, collaborative approach is used to solve the problem.
2. **Exemption Mechanisms:** In EPA "Project XL" regulatory discretion (i.e., changing the requirements for compliance) is favored by both industry participants and the agency over enforcement discretion (i.e., ignoring or forgiving violations within the program). Some agencies have used site- or project-specific rules or orders as a mechanism for implementing regulatory discretion.

3. **Program Comprehensiveness:** The demonstrations can be issue-specific or program-wide depending on the interests of the participants and the needs of OPS. Even if the initial focus is on specific individual problems rather than on the broad application of risk management, the demonstrations will help establish the context for broader application of risk management.
Attachment 1

Regulatory Agency Programs Surveyed

EPA
"Project XL" [EPA Project "XL"]
Environmental Leadership Program [EPA ELP]
Common Sense Initiative [EPA CSI]
Risk Management Programs Under the Clean Air Act [EPA CAA/RMP]

OSHA
Voluntary Protection Program [OSHA VPP]

Coast Guard
Prevention Through People [Coast Guard PTP]

NRC:
Advisory Committee on Reactor Safeguards [NRC ACRS]
Risk Informed Regulation [NRC Risk-Informed Reg]
Systematic Evaluation Program [NRC SEP]
Risk Informed Tech Specs [NRC Risk Informed Tech Specs]
Severe Accident Policy [NRC Severe Accident Policy]
Maintenance Rule [NRC Maintenance Rule]

California
Risk Management and Prevention Program [Cal RMPP]

Delaware
Industrial Disaster Prevention Program [Del IDPP]

New Jersey
Toxic Catastrophe Prevention Program [NJ TCPP]
Risk Management Public Meeting
New Orleans, LA
January 28, 1997

Attendance List

Please review the information. If any corrections are needed, mark the changes on the attendance list and fax the corrected page to Sue von Herrmann at 703-768-0655. A cover sheet is not needed with your fax.

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