U.S. Department
of Transportation
**Research and
Special Programs
Administration**

400 Seventh St., S.W.
Washington, D.C. 20590

AUG 15 2003

The Honorable Ellen G. Engleman
Chairman
National Transportation Safety Board
490 L'Enfant Plaza East, SW
Washington, DC 20594

Dear Chairman Engleman:

This letter is the Research and Special Programs Administration's (RSPA) response to the National Transportation Safety Board (NTSB) Safety Recommendations P-03-1, P-03-2, and P-03-3, resulting from the accident in Carlsbad, New Mexico. RSPA requests that these recommendations be classified as "OPEN - Acceptable Action" based on the actions we are taking in compliance, research, regulations, and most notably, our impending final rule on gas pipeline integrity management.

We expect to request closure of Recommendation P-03-1 in early 2004 with the issuance of a proposed rule to address internal corrosion issues in the design and construction of gas transmission pipes. This rule will require pipeline operators to implement measures to reduce the opportunity for liquids to accumulate, provide for effective liquid removal features, require accommodation of corrosion monitoring devices, and incorporate by reference consensus standards and the results of ongoing research.

By the end of 2003, we will request closure of Recommendation P-03-2 based on publication of the final rule on gas integrity management, which will address the role of water and other contaminants in the internal corrosion process and the procedures for prevention, inspection, and repair. The rule will require operators using direct assessment to follow the requirement in standard ASME/ANSI B31.8S, Appendix SP-B2, which was developed with contributions from RSPA/OPS, the pipeline industry, and the state pipeline safety programs.

In early 2004, we expect to request closure of Recommendation P-03-3 based on our revamped inspection protocols and improved inspection tracking and coordination with our legal office to ensure violations of our regulations are enforced more effectively.

If we can be of further assistance, please contact me or James Wiggins, Director of Policy and Program Support, at (202) 366-4831.

Sincerely yours,

Samuel G. Bonasso
Acting Administrator

Enclosure

cc: Robert Chipkevich, NTSB
Rod Dyck, NTSB

RSPA Response to
NTSB Safety Recommendations
P-03-1, P-03-2, and P-03-3

P-03-1 **Revise 49 Code of Federal Regulation Part 192 to require that new or replaced pipelines be designed and constructed with features to mitigate internal corrosion. At a minimum, such pipelines should (1) be configured to reduce the opportunity for liquids to accumulate, (2) be equipped with effective liquid removal features, and (3) be able to accommodate corrosion monitoring devices at locations with the greatest potential for internal corrosion.**

Status: Initial RSPA response to recommendation.

Initial Response: The Research and Special Programs Administration, Office of Pipeline Safety (RSPA/OPS) is considering changes to the design and construction sections of Part 192 to ensure that internal corrosion prevention is incorporated in the design and construction of gas transmission pipelines. Any changes will be informed by both our integrity management program (IMP) and research initiatives. We agree that the possibility of liquid accumulation in a pipeline needs to be addressed in design and construction, not just in operations and maintenance. An analysis of corrosion possibilities at low points on the pipeline needs to be considered in the design. Drips and traps need to be constructed to minimize the retention of water and electrolytic liquids in the pipeline. And, new and replaced pipelines can be equipped with more effective liquid removal features and can be designed to accommodate corrosion monitoring devices at suspect locations.

As noted in our response to Recommendation P-03-2, RSPA/OPS proposed to require gas pipeline operators to develop integrity management programs for gas transmission pipelines that could impact high consequence areas (HCAs) and to apply lessons learned in these programs to the entire pipeline as needed (January 28, 2003; 68 FR 4278). This proposal introduced the concept of internal corrosion direct assessment (ICDA) for gas pipelines. The lessons learned from implementation of the gas integrity management program will help us identify design and construction features that should be included in the gas pipeline safety regulations to minimize internal corrosion.

RSPA/OPS manages research to improve the technical and analytical foundation necessary for planning, evaluating, and implementing technical and regulatory solutions to pipeline safety issues, including internal corrosion prevention, detection, and mitigation. Recent research projects are focused on: leak detection; detection of mechanical damage; damage prevention; improved pipeline system controls, monitoring, and operations; and, improvements in pipeline materials. RSPA/OPS has issued three broad agency announcements (BAA) for pipeline research and development and has awarded approximately $2.8 million for 13 research projects. Another $3 million in funding has been provided by industry. RSPA/OPS expects to announce project awards for its third BAA by mid-August 2003 for research projects to

improve pipeline materials and extend the integrity and lifetime of installed pipelines and their various components. Internal corrosion issues have been considered in making the awards.

One of the projects already funded by RSPA/OPS addresses Internal Corrosion Direct Assessment (ICDA) of gas transmission, storage, and gathering pipeline systems. It is being conducted by Southwest Research Institute and is co-funded by Pipeline Research Council International (PRCI), Interstate Natural Gas Association of America (INGAA), and Southern California Gas, at a total cost of over $500,000. The first task under the project is to develop and validate a method to assess the integrity of pipelines with respect to internal corrosion by identifying and prioritizing locations of corrosion damage. The final product will be applicable to both dry and wet gas lines, including those lines that cannot be inspected using in-line inspection (ILI) tools. A second task will focus on a probabilistic method to predict the distribution of corrosion along the pipeline. If successful, a single methodology for internal corrosion direct assessment will be available for identifying the locations most likely to suffer internal corrosion.

We expect to request closure of this recommendation in early 2004 with the issuance of a proposed rule to address internal corrosion issues in the design and construction of gas transmission pipes. This rule will require pipeline operators to implement measures to reduce the opportunity for liquids to accumulate, provide for effective liquid removal features, require accommodation of corrosion monitoring devices, and incorporate by reference consensus standards and the results of ongoing research.

Action Requested: RSPA requests that Safety Recommendation P-03-1 be classified as "OPEN – Acceptable Response" based on the foregoing.

P-03-2 **Develop the requirements necessary to ensure that pipeline operators' internal corrosion control programs address the role of water and other contaminants in the corrosion process.**

Status: Initial RSPA response to recommendation.

Initial Response: Even before this recommendation was issued, RSPA/OPS had issued an advisory bulletin on internal corrosion in gas transmission pipelines (September 5, 2000; 65 FR 53803) that urged operators to review their internal corrosion monitoring programs and consider factors that influence the formation of corrosion, including gas quality, operating parameters, and pipeline profile. The advisory bulletin also suggested that operators review internal corrosion testing procedures through the use of coupons, radiography, water chemistry tests, in-line inspection tools, and electrical and hydrogen probes. The advisory bulletin noted that internal corrosion can be aggravated by flow characteristics, temperature, pressure, presence of oxygen, carbon dioxide, hydrogen sulfide, and the presence of drips and sags that cannot be cleaned. Pipeline areas that require close attention for internal corrosion formation were cited as pipe downstream of storage facilities, low spots, sharp bends, diameter changes, and fittings that restrict flow.

After the RSPA/OPS issuance of this advisory bulletin, RSPA/OPS encouraged the Gas Piping Technology Committee (GPTC) to establish an *ad hoc* committee to review the guide material on internal corrosion under Sections 192.479 and 192.477. GPTC is a standards committee that develops and publishes the widely used *Guide for Gas Transmission and Distribution Piping Systems*. The Guide provides commentaries on each of the sections of the gas piping regulations (49 CFR Part 192) to help pipeline companies comply with the regulations. The draft document contains suggestions for the prevention and mitigation of internal corrosion, including sections on design considerations, detection methods, inspection frequency, and technical references. It is expected to be finalized by the end of 2003.

RSPA/OPS has also worked with NACE International to develop standards addressing internal corrosion. We encouraged NACE International to develop an internal corrosion training course. The first course (NACE Course 03C41404) will be presented in November 2003 to RSPA/OPS and state pipeline safety program inspectors. The course addresses types of internal corrosion, environmental variables, sampling and field testing, direct examination, coupons and electric probes, laboratory analysis, mitigation and monitoring methods, and integrity assessment.

On January 28, 2003, RSPA/OPS proposed to require gas pipeline operators to develop integrity management programs for transmission pipelines that could impact high consequence areas (HCAs) and to apply lessons learned in these programs to the entire pipeline as needed (68 FR 4278). A vote by the Technical Pipeline Safety Standards Committee (TPSSC), the statutory gas safety advisory committee, on May 29, 2003 supported a requirement for

operators to use risk assessment techniques from ASME B31.8S, *Supplement to B31.8 on Managing System Integrity of Gas Pipelines*, to evaluate the remainder of the pipeline to determine whether a full assessment and inspection is warranted.

The proposed gas integrity management rule introduced the concept of internal corrosion direct assessment (ICDA), which is an assessment process that identifies areas along the pipeline where water and other contaminants may reside and then focuses direct examination on the location where internal corrosion is most likely to exist. RSPA/OPS has worked with NACE International to develop ICDA procedures. The ICDA methods can be used to assess internal corrosion in pipelines. These methods are also applicable to pipelines that normally carry dry gas but may be subject to occasional accumulations of water and other electrolytes. The goal of the approach is to determine if internal corrosion is likely to exist at a particular location along a pipeline. The enforcement protocols for the gas integrity management rule will provide inspectors with detailed approaches to inspection of operator programs to ensure that the role of water and other contaminants on the internal corrosion process is fully addressed in pipeline operations and maintenance.

We expect to request closure of this recommendation by the end of 2003 based on publication of the final rule on gas integrity management, which will address the role of water and other contaminants in the internal corrosion process and the procedures for prevention, inspection, and repair. We expect the rule will address the recommendation of the TPSSC to require operators using direct assessment to follow the requirement in standard ASME/ANSI B31.8S, Appendix SP-B2, which was developed with contributions from RSPA/OPS, the pipeline industry, and the state pipeline safety programs.

Action Requested: RSPA requests that Safety Recommendation P-03-2 be classified as "OPEN – Acceptable Response" based on the foregoing.

P-03-3 **Evaluate the Office of Pipeline Safety's pipeline operator inspection program to identify deficiencies that resulted in the failure of inspectors, before the Carlsbad, New Mexico, accident, to identify the inadequacies in El Paso Natural Gas Company's internal corrosion control program. Implement the changes necessary to ensure adequate assessments of pipeline operator safety programs.**

Status: Initial RSPA response to recommendation.

Initial Response: RSPA/OPS is taking action to improve the pipeline operator inspection program to ensure that operator internal corrosion programs adequately address internal corrosion issues. We have created a new position of Senior General Engineer/Enforcement Chief which was filled on March 23, 2003, by a person with 32 years of experience in pipelines. The primary function of that position is to update enforcement policies, establish inspection priorities, and develop inspection protocols. He is now auditing RSPA/OPS regional programs to understand where we are and how we can build an even more effective enforcement program. Some of the improvements will include new technology, improved inspection tracking, and better coordination with our legal office to ensure violations of our regulations are enforced more effectively. The Senior General Engineer/Enforcement Chief is also working to improve communications between RSPA/OPS headquarters and field inspection staff to ensure that all enforcement policies, including a more intense focus on internal corrosion issues, are fully understood and implemented.

In 2000 RSPA/OPS updated the compliance manual to include the Natural Gas High Impact Form (NHIF) to help inspectors pose probing questions on critical pipeline safety issues, including the adequacy of an operator's internal corrosion control program. We instructed our inspectors that one of three key areas of concentration was to examine what operators are doing to mitigate internal corrosion. Guidance on inspection for internal corrosion was included in the compliance manual and on the revised "Standard Inspection Report of a Gas Transmission Pipeline" and "Gas Storage Field Review" inspections forms.

The RSPA/OPS Senior General Engineer/Enforcement Chief is now working with the Transportation Safety Institute (TSI) to revamp our general inspection protocols and compliance manual in light of the recently developed integrity management inspection protocols and other programmatic changes. With the completion of the gas transmission pipeline integrity management rule, operators will be subject to new requirements for detection and mitigation of internal corrosion in high consequence areas (HCAs) and the application of any lessons learned to the entire pipeline system. The current review of our inspection protocols will address evaluation of internal corrosion control programs during regular pipeline operator inspections by Federal and state inspectors, as well as during integrity management program inspections.

RSPA/OPS has also completed a redesign of the gas pipeline incident form and the gas pipeline annual report form to obtain more detailed information on causes of accidents and ages of pipeline infrastructure. This more detailed data will help our inspectors focus more resources on actual causes of accidents, including internal corrosion.

We expect to request closure of this recommendation in early 2004 based on our revamped inspection protocols and improved inspection tracking and coordination with our legal office to ensure violations of our regulations are enforced more effectively.

Action Requested: RSPA requests that Safety Recommendation P-03-3 be classified as "OPEN – Acceptable Response" based on the foregoing.