June 20, 1978

Mr. Robert Steffan, Chairman
Southern California Cathodic
Protection Committee
National Association of
Corrosion Engineers
P.O. Box 1499
Houston, Texas 77001

Mr. M.J. Schiff, Director
Los Angeles Section
National Association of
Corrosion Engineers
P.O. Box 1499
Houston, Texas 77001

Gentlemen:

This responds to your letter of April 19, 1978, regarding your assertion that some of the corrosion contractors are not qualified and are doing substandard corrosion work for master meter system operators trying to comply with the Federal pipeline safety standards.

You ask what enforcement is available from Federal and State agencies. You further inquire if it is practical to require persons designing and/or installing corrosion control systems to accept some legal responsibility for their work.

The Federal standard (192.453) require the operator to "...establish procedures to implement the requirements of this subpart" and that "...the design, installation, and maintenance of cathodic protection systems must be carried out, by or under the direction of a person qualified by experience and training in pipeline corrosion control methods." This Office has jurisdictional authority over operators of natural gas pipeline systems under the Natural Gas Pipeline Safety Act of 1968 and, therefore, our surveillance and enforcement program is directed toward operators to assure that they comply with the Federal gas pipeline safety standards. Since our authority does not extend to corrosion contractors designing and installing cathodic protection for such operators, we cannot place requirements on such contractors. This is not to say that operators and corrosion contractors cannot enter into contractual relationships that place a legal responsibility on the contractor for the adequacy of his corrosion work. Such contractual relationships would not alter the legal relationship between this Office and the operator, but it could establish the basis for legal actions between the operator and contractor.

The Office of Operations and Enforcement has a Regional Office in Burlingame, California, that is responsible for inspecting operators and assuring compliance with the regulations. Because of the limited staff, their primary inspection efforts are aimed

at distribution systems and, to a lesser degree, master meter systems.

Thank you for your interest in matters of pipeline safety.

Sincerely,

\signed\

Robert L. Paullin
Associate Director for
Operations & Enforcement
Materials Transportation Bureau

LOS ANGELES SECTION

April 19, 1978

U.S. Department of Transportation
Materials Transportation Bureau
Washington, D.C. 20590

Attention: Cesar DeLeon, Acting Director
Office of Pipeline Safety Operation

Reference: Cathodic Protection of Pipelines

Gentlemen:

As officers of the Los Angeles Section of the National Association of Corrosion Engineers and of the Southern California Cathodic Protection Committee, we have been requested to obtain information from you regarding substandard work in the application of cathodic protection to control corrosion on underground gas lines.

The Federal Pipeline Safety Act of 1968 required that cathodic protection be applied to underground gas lines subject to active corrosion which might pose a hazard to the public safety. Interpretation of this act to include master meter operations, such as mobile home parks, has resulted in many new companies being formed to design and install cathodic protection for such applications.

The federal law states that such work must be done "by, or under the direction of a person qualified by experience and training in pipeline corrosion control methods". The attached quotations from cathodic protection survey reports and photograph of an anode installation demonstrate that some of the contractors are not qualified to do this work, and, in fact, are actually increasing the safety hazards. It is apparent that Federal and State laws are being broken.

We recognize that code violations can be reported to contractors' licensing boards. This, however, does not prevent incompetent contractors from operating. We would like to know if and what enforcement is available from Federal and State Agencies. How and from whom should it be obtained?

Is it practical to require that the person qualified to design and/or install systems sign reports and accept some legal responsibility for their work.

Very truly yours,

\signed\ \signed\

Robert Steffan, Chairman
Southern California
Cathodic Protection Committee

M.J. Schiff, Director
Los Angeles Section
National Association of Corrosion Engineers

Attachment

Company B

INTRODUCTION

Underground gas leaks may be undetectable when the odor is filtered out by the soil. Underground gas leaks often migrate and collect in or under structures creating an explosive hazard. Underground gas leaks are primarily caused by corrosion. Our gas leak survey and corrosion test was performed to determine whether pipes are now leaking and whether the pipes are in a corrosive environment and thus likely to develop future leaks.

The Pipeline Safety Act requires among other things, that gas distributors survey to locate and classify gas leaks according to hazard. It further requires that gas distributors either establish that there is no corrosion or install equipment which will minimize corrosion.

Because pipes may be corroding at one location and not corroding a few feet away, it is economically impractical to dig enough trenches and holes to visually examine all areas and determine they are not corroding. Thus corrosion engineers use electrical tests to determine (a) whether soil conditions are of the type which promote corrosion and (b) whether corrosive electrical currents may be flowing in the underground piping.

_____ personnel surveyed your mobile home park and performed tests which usually yield an accurate estimate of the size and type of corrosion control installation needed to protect underground piping.

Our leak report, describing the leaks found is included here as Appendix I. Appendix II reports our measurements of soil resistivity and pipe-to-soil potentials at various points within the park.

In the pages which follow we report our survey findings and conclusion. We also recommend action for you to take in order to lengthen your pipe life and satisfy Federal safety regulations.

FINDINGS

LEAKS

Leaks are detailed, listed and graded in Appendix I. Grade 1 leaks are hazardous and must be cleared immediately (You have already been notified, if you have any). Grade 2 leaks are potentially hazardous and should be repaired within 1 year according to the Department of Transportation requirements. Grade 3 leaks are non-hazardous and must either be repaired or monitored annually.

Smith & Dension surveyors found:

0 Grade 1 Leaks

0 Grade 2 Leaks

0 Grade 3 Leaks

CATHODIC PROTECTION

Our survey showed that voltages measured between gas pipes and surrounding soil varied at various points in the park (see Appendix II). The maximum voltage variation measured was .150 volts. This is one indicator of the flow of corrosion currents. The highest voltage measured was only .600 volts. This value is absolutely smaller than the 0.850 volts needed to provide protection.

SOIL RESISTIVITY

Soil resistivity was measured. The measured resistivity was 5000 ohm/cm^3. Resistivities below 3000 ohm/cm^3 coupled with significant variations in pipe-to-pipe potentials indicate a hot soil; that is, a soil which promotes rapid corrosion. With higher values of resistivity, corrosion proceeds more slowly.

ISOLATION

Our tests indicate that your pipeline system is not electrically insulated from the gas utility distribution system.

CONCLUSION & RECOMMENDATIONS

PIPELINE CONDITIONS

Low and variable pipe-to-soil potentials and a relatively low soil resistivity indicate that the soil is corrosive, that actual corrosion currents are flowing from the pipes into the ground, and that a cathodic protection installation is required to inhibit active corrosion.

NEED FOR PROTECTION

Installing a cathodic protection system will increase the life of your pipe and reduce the leaks and the cost of repairs in future years. Further, it will bring your gas distribution system within full compliance of the Pipeline Safety Act of 1968 and should thus reduce your liability in the case of an accident. At the same time, you can also protect your metal water pipes. Water system electrolysis though less dangerous than gas line corrosion and not required by law, is equally costly to repair. Further, protecting both sets of pipes at the same time avoids the costly effort of inserting an insulating coupling in the riser at each coach and digging up the gas water pipes and separating them wherever they are in contact.

We have calculated that the amount of power required to protect both your gas piping and your water is about 100 watts. This power can most economically be obtained from small rectifiers connected to your powerline.

PROPOSAL

INSTALLATION

The cathodic protection installation will comprise 6 large graphite anodes buried in the ground and 1 transformer rectifiers power supplies connected so as to maintain your pipes at a negative potential higher than .850 volts. This potential will cause current to flow from the anode bed to your pipe, thereby inhibiting the ion corrosion now occurring. _____ will excavate, back fill, resurface, install and wire the system required to cathodically protect your pipes and restore your property to its original condition.

The transformer/rectifier will be mounted on an appropriate wall or post and wired to your AC power line. All components of the system are designed for a life of 20 years. Maintenance and monitoring instrumentation is built into the rectifier unit.

WARRANTEE

_____ installations are completely guaranteed for a period of 1 year against defects in materials and workmanship. Follow up tests will be made at our expense within 1 year from date of installation completion to assure adequate performance.

REPORTS

We will prepare and submit in a manual the following plans needed for operating your distribution system in full compliance with the Pipeline Safety Act of 1968:

1) Operating plan

2) Maintenance plan

3) Emergency plan

PRICE

The total price is $4,747.00 subject to the following conditions:

1) Sewer pipe is non-metallic.

2) No other underground metallic structures interfere with, or are influenced by the current flowing from the anode bed.

3) Rock, if any, lies deeper than 8 feet below the soil surface in areas where anodes are to be buried.

4) Screwed pipe joints if any, are not so rusted that they fail

TERMS

30% with authorization to proceed.

70% when installation and test are complete.

SCHEDULE

We will schedule your project within 30 days after you authorize us to proceed. Normal installation time is five working days: Two days for excavating installation and refill and three days for test and adjustment. In subsequent weeks we will revisit the park as often as necessary for inspection and minor adjustments to compensate for gradual polarization which modifies system drains as the voltages and currents equalize through the system. We will also notify you of any pre-existing corrosion we discover as they are revealed by corrosion scale loosening.

This proposal is valid for 30 days. To authorize us to proceed please sign below and return with an advance payment of 30%.

For:_____ For:_____

Contractor's License:_____

Signed:_____ _____

President

Date:_____ Signed:_____

Date:_____

Attachment

COMPLETE CORROSION DATA

pipe-to-soil potential reading

location	reading (dc volts)
22	.53
7	.45
12	.55
1	.51
25	.6
29	.52

Soils resistivity Measured in ohm/cm^3

depth	reading (ohm/cm^3)
8 ft.	5000