

Mr. Ralph Nery
State of North Carolina
Utilities Commission
Raleigh, North Carolina 27602

Dear Mr. Nery:

This refers to the Commission's Order in Docket No. G-1, Sub 58, granting the United Cities Gas Company (UCGC) a three year extension of the August 1, 1976, deadline for compliance with 49 CFR 192.457(b) for approximately 23 miles of coated mains and 21 miles of bare mains. The Order has been assigned OPSO Docket No. NC-76-3.

As you know, the authority of a State agency under Sec. 3(e) of the Natural Gas Pipeline Safety Act of 1968 to grant waivers from the Federal standards is conditioned upon the State agency giving the Secretary "written notice at least 60 days prior to the effective date of the waiver." Sec 3(e) further provides that if the Secretary objects in writing before the effective date of a waiver, the State agency action granting the waiver will be stayed. Normally, the 60-day or longer period within which the Secretary may object begins to run when the Department receives a letter transmitting a State agency waiver for our review. In our normal business routine, that letter and waiver is then immediately assigned for acknowledgement and response within a designated time. In this docket, however, the Commission's Order, which we received by mail on July 2, 1976 was not accompanied by a letter of transmittal. As a consequence, the matter was not immediately assigned for action in the course of our normal business routine, and we did not begin our review until recently. Under these circumstances, we believe that the Secretary's statutory period for review of the Commission's action began when we identified the Order as a State waiver requiring our review and that the period has not yet expired.

We object to the granting of the waiver for the following reasons: With regard to the coated mains, the record indicates that 3 of the 23 miles are to be cathodically protected by a rectifier, which has not been installed because of right-of-way difficulties. The remaining 14 miles are not to be protected until UCGC isolated short sections from bare mains and removes external shorts. We do not find that these excuses are sufficient justification for waiving the August 1, 1976, deadline for the 23 miles of mains involved. There is nothing in the record to indicate that the problems encountered by UCGC were unavoidable or that compliance could not have reasonably been achieved within the five year period which the deadline allowed.

With regard to the 21 miles of bare mains, the waiver from Section 192.457(b) is intended to permit UCGC to continue a program of "hot spot" protection and replacement based on leaks and leak history records in lieu of conducting an electrical survey on the mains to find areas of active corrosion. The only reasons advanced by UCGC in support of the waiver relate to why conducting an electrical survey is impractical. Because Section 192.457(b) provides that an operator need not conduct an electrical survey in "impractical" situations, the waiver appears unnecessary. However, UCGC's rationale as to why conducting an electrical survey is impractical is inconsistent with our recently published interpretation of "impractical" as the term is used in Section 192.457(b) (41 FR 28128, July 15, 1976). For instance, UCGC has apparently created much of the alleged impracticality itself by installing anodes and insulated couplings. Furthermore, UCGC's alleged difficulties are not shown to be in the nature of "extreme hardship, trouble or expense" as the published interpretation provides. Thus, in the absence of a waiver, UCGC's use of leaks and leak history records to determine areas of active corrosion violates not only Section 192.457(b) but in the future would violate the monitoring requirements of Section 192.457(e). Nevertheless, since UCGC has not presented reasons why a waiver should be granted other than those relating to the alleged impracticality of making an electrical survey, there is no basis for finding that a waiver is appropriate.

A waiver is intended for situations where a pipeline safety standard of general applicability is inappropriate in a specific situation. UCGC has not shown that Section 192.457(b) is inappropriate. In fact, UCGC apparently plans to make an effort to meet the Federal standards. The various excuses advanced by UCGC may of course be considered by the Commission in determining the nature of its enforcement actions. Both OPSO and State agency compliance efforts included discretionary action to defer imposition of penalty or other sanction while an operator executes a plan of compliance.

Therefore, in accordance with Section 3(e) of the Natural Gas Pipeline safety Act of 1968 (49 USC 1672 (e)), the Commission's action is hereby stayed. The Commission may appeal this decision and request an opportunity for a hearing within 60 days from the date of this letter.

Sincerely,

SIGNED

Cesar DeLeon

Acting Director

Office of Pipeline

Safety Operations

STATE OF NORTH CAROLINA
UTILITIES COMMISSION
RALEIGH, NORTH CAROLINA
DOCKET NO. G-1 , SUB 58

BEFORE PILE NORTH CAROLINA UTILITIES COMMISSION

In the Matter of
Petition of united Cities Gas Company for an)
Extension of Time to Comply with the Safety)
Standards as set forth in Title 49, Part 192 -) ORDER
Transportation of Natural and Other Gas By) GRANTING
Pipeline; Subpart I, Requirements for Corrosion) WAIVER
Control)

BY THE COMMISSION: The minimum Federal safety standards for pipeline facilities and the transportation of gas, 49 CFR 192, et mg., were made applicable to all natural as public utilities and municipal natural gas facilities in North Carolina by Commission Order in Docket No. G-100, Sub 13, dated December 30, 1970, and issued pursuant to G.S. 62-5n. The Commission has entered into an agreement with and has been certified by the United States Department of Transportation, pursuant to 49 USCA 0674(a) and (b), to regulate and/or inspect all natural gas and pipeline facilities in North Carolina for compliance with the minimum Federal safety standards.

49 USCA §1672(e) provides in part as follows:

"[a] State Agency with respect to which there is in effect a certification pursuant to section 1674(a) of this title or an agreement pursuant to section 1674(b) of this title, may waive compliance with a safety standard in the same manner as the Secretary [of Transportation], provided such State Agency gives the Secretary written notice at least sixty days prior to the effective date of the waiver."

On June 15, 1976, United Cities Gas Company (hereinafter referred to as United Cities or the Company), filed with this Commission a petition seeking waiver of the effective date for compliance with certain requirements of the minimum Federal safety standards, to wit: 49 CFR 192, Subpart I, dealing with external corrosion control of buried or submerged pipelines.

Section 192.457(b)(3) of Subpart I provides that bare or coated distribution pipelines installed prior to August 1, 1971, must, not later than August 1, 1976, be cathodically protected "in areas in which active corrosion is found." It further provides that "the operator shall determine the areas of active corrosion by electrical survey, or where electrical survey is impractical, by the study of corrosion and leak history records, by leak detection survey or by other means."

United Cities requests the Commission to extend the deadline for compliance with the requirements of 49 CFR 192.457(b)(3) from August 1, 1976, to August 1, 1979.

In its petition United Cities shows that its facilities located in Hendersonville, North Carolina, consist of 110 miles of distribution mains and 2,857 service lines which are constructed of bare steel, coated and wrapped steel, and plastic. As of June 1, 1976, 52 miles or 68% the Company's coated and wrapped steel system were under cathodic protection. A rectifier has been ordered which, when installed, will protect an additional nine miles of mains, bringing 81% of the coated and wrapped system under cathodic protection. (United Cities maintains that installation of this rectifier has been delayed by difficulty in obtaining a right-of-way for the ground bed location.) In order to protect the remaining 14 miles of coated and wrapped steel mains, most of which were installed prior to 1960, United Cities will have to isolate many short sections from bare mains and remove external shorts.

The attached chart 1, prepared by the Gas Section of the Commission Engineering Staff, illustrates the progress of upgrading and cathodically protecting United Cities' Hendersonville system and contains the Staff's projections for facilities protection during the waiver period.

United Cities also shows in its petition that in the last five years it has replaced eight miles of bare steel mains either with coated and wrapped steel pipe (now under protection) or with plastic pipe. The Company contends that its

remaining 21 miles of bare mains will be the most difficult, time consuming, and expensive to protect and, further, that, based on its leak history records and its program of "hot spot" protection, active corrosion does not exist on these mains. United Cities states that it will continue to reevaluate its corrosion leak history records and will replace bare mains wherever the "hot spot" method fails to eliminate corrosion leaks.

The Commission Staff reports that in 1972 United Cities filed corrosion control procedures which outlined the Company's procedures for compliance with Subpart I. Those procedures include the following:

"REPAIRS - CORROSION:

- 1) Whenever a corrosion leak is uncovered the main or service shall be wired brushed and thoroughly cleaned for a distance of 12" on either side of the leak;
- 2) A standard leak clamp shall be installed;
- 3) If the leak occurs on a main, a 94 anode shall be installed. If the leak is on a service line a 3# anode shall be installed;
- 4) The entire 24 inches of pipe shall be coated with Bitumastic 505 or Thick-N-Quick Mastic or other approved material."

The above procedure, commonly referred to as "hot spot" protection, has been used by United Cities for over ten years, and numerous anodes have been installed. The presence of anodes is known to adversely affect the accuracy of electrical surveys. Therefore, electrical surveys of the bare portion of the system have been considered impractical, and the "hot spot" method has been continued as an appropriate part of the Company's overall corrosion control plan.

In a July 1975 status report to the Commission, United Cities stated with respect to its bare steel facilities as follows:

"On examination of past construction practices it has been determined that it is impractical to run meaningful electrical surveys on the twenty four miles of bare mains. These mains have been coupled together with both insulated and uninsulated couplings and no record has been kept of their location. Because of this condition meaningful continuity surveys can not be conducted. In addition, for the last fifteen years, nine pound anodes have been installed for "hot spot" protection and the current from these anodes have an adverse effect on the interpretation of any surveys. In order to overcome these problems, and to monitor these areas "Leak Progression Maps" have been prepared. Main leaks are posted to this map, color coded as to year, and symbolized according to classification. These areas are then surveyed by flame ionization. If active corrosion is not mitigated by the "hot spot" protection program these areas will then be scheduled for replacement with plastic pipe."

The Company proposed to continue, during the waiver period, a program of system improvement involving replacing bare mains when conditions warrant, cathodically protecting all coated and wrapped steel mains, conducting annual cathodic protection maintenance surveys as required, installing meter sets and eliminating shorts, and applying "hot spot" protection wherever corrosion leaks are found.

Based upon the foregoing, the petition filed by United Cities, the report submitted by the Commission Staff, and the entire record in this matter, the Commission makes the following

FINDINGS OF FACT

1. That United Cities Gas Company is a natural gas distributor subject to the gas pipeline safety jurisdiction of this Commission.
2. That United Cities' distribution system consists of 110 miles of mains, of which 76 miles are coated and wrapped steel and 21 miles are bare steel, and 2,357 service lines.
3. That United Cities intends to cathodically protect all of its coated and wrapped facilities instead of conducting electrical surveys to determine areas of active corrosion.
4. That as of June 1, 1976, United Cities has achieved Cathodic protection on 52 miles, or 69%, of its coated

and wrapped main system.

5. That a rectifier has been ordered for cathodic protection of an additional nine miles Of coated and wrapped mains, which, when installed, will bring 81% of the coated and wrapped system under cathodic protection.

6. That for the last 15 years United Cities has used "hot spot" protection on its bare steel mains, installing numerous anodes, which has made electrical surveys on these lines impractical.

7. That United Cities proposes to continue a program of "hot spot" protection and replacement on the bare steel portion of its main system.

8. That United Cities proposes to continue a program of corrosion control which, when completed, will meet the requirements of 49 CFR 192.457(b).

Based upon the foregoing Findings of Fact the Commission reaches the following

CONCLUSIONS

1. That a three-year extension of the effective date of compliance with the requirements 49 CFR 192.457(b) is necessary in order to allow United Cities Gas Company to complete its program of cathodic protection for its gas pipeline system and is not inconsistent with gas pipeline safety.

2. That a program of "hot spot" protection and replacing bare mains is a reasonable and effective means of protecting these lines against corrosion leaks, is not inconsistent with gas pipeline safety, and should be allowed to be continued until the entire system is brought under cathodic protection.

IT IS, THEREFORE, ORDERED as follows:

1. That United Cities Gas Company be, and hereby is, granted a waiver of the effective date of compliance with the requirements of the minimum Federal safety standards for pipeline facilities and the transportation of gas, 49 CFR 192.457(b), from August 1, 1976, to August 1, 1979, provided:

- (a) That United Cities shall continue a program of conducting annual cathodic protection maintenance surveys and of insulating meter sets and eliminating shorts.
- (b) That United Cities shall continue a program of "hot spot" protection on its bare mains wherever corrosion leaks are found and, if corrosion is not mitigated, shall replace these areas with plastic pipe or coated and wrapped steel pipe.
- (c) That United Cities shall conduct leak surveys on all unprotected steel facilities at least once every three years and annually in business areas.

2. That during the waiver period United Cities shall file with the Commission a progress report on the form entitled, "NCUC Waiver Report," attached hereto as Appendix I. The first report, for the period ending August 1, 1976, shall be filed not later than August 15, 1976; thereafter, all reports shall be filed semiannually, for the period ending February 1 and August 1, not later than February 15 and August 15, respectively.

3. That a copy of this Order shall be forwarded to the Secretary of the Department of Transportation to constitute written notice of the waiver to be granted herein, and that this Order shall become effective 60 days from the date of receipt by the office of the Secretary of the Department of Transportation.

ISSUED BY ORDER OF THE COMMISSION.

This the 30th day of June, 1976.

NORTH CAROLINA UTILITIES COMMISSION

Katherine M. Peele, Chief Clerk

NCUC GAS SECTION ANALYSIS OF APPLICATION BY UNITED
CITIES FOR WAIVER FO COMPLIANCE TO 49 CFR 192.457

The United Cities Gas Company, 1200 Parkway Towers, 404 James Robertson Parkway, Nashville, Tennessee 37219, telephone number: 615-244-3766 with North Carolina facilities operating as United Cities Gas Company, 130 South Main Street, Post Office Box 2000, Hendersonville, North Carolina 29739, telephone number: 704-692-0513, being a natural gas operator within the state of North Carolina, has petitioned the North Carolina Utilities Commission requesting a waiver of the requirements of 49 CFR 192.457(b) to, in effect, extend the deadline for compliance to said regulation from August 1, 1976, to August 1, 1979.

The Gas Section Staff herewith reports the following in response to that petition and recommends that a waiver be granted based on the following information and analysis.

The waiver petition filed for the Hendersonville Division of United Cities Gas Company (United Cities) is attached hereto and is noted as being filed in accordance with the Gas Section Staff's request for Minimum Data in Support of Waiver Applications.

The regulation which pertains to this waiver is 49 CFR 192.457(b)(3). United Cities' Hendersonville system has no transmission facilities and presently complies with providing protection of new facilities and with the monitoring of existing cathodically protected segments to which the other sections of Subpart I pertain. Subsection (b)(3) of Section 192.457 generally provides that buried or submerged distribution pipelines installed prior to August 1, 1971, must, no later than August 1, 1976, be cathodically protected "in areas in which active corrosion is found." That subsection further provides that "the operator shall determine the areas of active corrosion by electrical survey, or where electrical survey is impractical, by the study of corrosion and leak history records, by leak detection survey or by other means." The Office of Pipeline Safety Operations has defined the term impractical as follows: "The phrase 'where electrical survey is impractical' as used in the subpart is to acknowledge those instances or situations where an operator, through no fault or shortcoming of its own, is incapable of performing an electrical survey due to extreme hardship, trouble, or expense."

In response to above language of the Minimum Federal Safety Regulations as adopted by the Commission in November, 1971, United Cities submitted an addition to its Operation & Maintenance Manual covering the operator's policies for complying with each subsection of Subpart I. Concerning this waiver petition it is noted that the filed procedures contain the following:

REPAIRS - CORROSION:

- 1) Whenever a corrosion leak is uncovered the main or service shall be wired brushed and thoroughly cleaned for a distance of 12" on either side of the leak;
- 2) A standard leak clamp shall be installed;
- 3) If the leak occurs on a main, a 9# anode shall be installed. If the leak is on a service line a 3# anode shall be installed;
- 4) The entire 24 inches of pipe shall be coated with Bitumastic 505 or Thick-lit-quick Mastic or other approved material.

The above procedures outline what is commonly called "Hot Spot" protection for corrosion control. United Cities has been using Hot Spot protection for over ten years and there are numerous anodes installed on the system. Through record monitoring, mains where Hot Spotting has not arrested active corrosion are noted and replaced. However, the Department of Transportation Office of Pipeline Safety Operation has determined that Hot Spot protection will not constitute cathodic protection for the entire facility.

It is an experienced fact that the existence of sacrificial anodes on a pipeline will not yield accurate pipe-to-soil potential surveys. The above procedure was therefore accepted as part of an overall cathodic protection program which employed the following corrosion plan for facilities installed prior to the adoption of the regulations:

- 1) Coated mains installed prior to August 1, 1971.

Surveys are scheduled for the coated and wrapped main, system, and emphasis will be placed on protecting the coated system.

2) Bare mains installed prior to August 1, 1971.

Efforts will proceed in all reasonable ways to comply with this requirement within the time stipulated. All methods listed in (h) (3) will be utilized. Our lead progression maps, which pictorially record areas of concentrated corrosion will be particularly valuable.

In that United Cities considered electrical survey of its bare system impractical, the Hot Spot method was an appropriate tool in attempting to mitigate corrosion leaks on its bare steel facilities.

United Cities restated its plan to cathodically protect all new installations and all coated and wrapped steel installed prior to August 1, 1971, end the use of corrosion leak records and maps to determine other areas of active corrosion in a status report to the Gas Section in February, 1974. United Cities projected a total expenditure of at least \$6,000 for corrosion, control on the Hendersonville system for 1974.

Similarly, a July, 1975 status report to the Gas Section displayed the operator's intention to cathodically protect all C/W steel and its justification for using records to determine areas of active corrosion on bare steel facilities. United Cities has stated:

On examination of past construction practices it has been determined that it is impractical to run meaningful electrical surveys on the twenty four miles of bare mains. These mains have been coupled together with both insulated and uninsulated couplings and no record has been kept of their location. Because of this condition meaningful continuity surveys can not be conducted. In addition, for the last fifteen years, nine pound anodes have been installed for "hot spot" protection and the current from these anodes have an adverse effect on the interpretation of any surveys. In order to overcome these problems, and to monitor these areas "Leak Progression Maps" have been prepared. Main leaks are posted to this map, color coded as to year, and symbolized according to classification. These areas are then surveyed by flame ionization. If active corrosion is not mitigated by the "hot spot" protection program these areas will then be scheduled for replacement with plastic pipe.

United Cities' Hendersonville system consists of 110 miles of distribution mains and 2857 service lines. These are listed on Chart 1 according to pipe type and year of installation. Demonstration of the progress of cathodic protection and system upgrading is noted by the corresponding change in totals of coated, bare, and plastic mains and services and in the totals of rains by installation dates. The Staff's projected facilities to be protected during the proposed waiver period also is attached.

From the preceding and the general record in this matter, the Gas Section has concluded the following:

- 1) United Cities has a procedure for corrosion control which meets or exceeds the Minimum Safety Regulations.
- 2) United Cities has, during the last four years, replaced bare steel Mains and services and cathodically protected C/W steel facilities.
- 3) The general public safety will not be greatly effected in that the operator is conducting frequent leak surveys and that the operator has a good safety record in the past.
- 4) That at the end of the waiver period, United Cities will, providing they meet their stated objectives, be in compliance with all of Subpart I.

Therefore, on the basis of the foregoing, the Gas Section Staff of the North Carolina Utilities Commission recommends that the Commission grant a waiver of compliance to the effective date of 49 CFR 192.457(14) providing that:

- a) United Cities conduct leak surveys on all unprotected steel facilities at least once every .3 years including annual surveys in business areas; and
- b) United Cities file a report of progress on the form attached on a semi-annual basis each August 1 and February 1 for the duration of the waiver.

United Cities Gas Company
1200 Parkway Towers
404 James Robertson Pkwy
Nashville, Tenn 37219

February 18, 1974

Mr. R. J. Nery, Chief Engineer
State of North Carolina
Utilities Commission
Raleigh, North Carolina 27607

Dear Mr. Nery:

The following information is submitted in compliance with your letter of February 6 in regards to compliance with "Requirements for Corrosion Control".

- I. Organization of U. C. G. Control
 - A. D. B. Boydston, Vice President and Chief Engineer
 - B. L. E. Jirikovec, Assistant Vice President of Operations, certified by NACE Accreditation Number 1774. Has responsibility for setting up the program. Twenty years experience.
 - C. Carl Collins, Operations Supervisor. Has had fifteen years experience. in corrosion control; ten years with Consumers Power Company, five years with United Cities. Has attended corrosion schools in Morgantown, West Virginia, and Purdue University. Has completed NACE Basic Corrosion Test and has requested certification from NACE.
- II. Our present plans are to protect one-third of the remaining C & W pipe in 1974, 1975, and 1976. In addition, leak progression maps are maintained which are used to determine areas of active corrosion. These maps have been maintained for the last four years.
- III. Attached is the completed report form. There are no transmission lines in Hendersonville.
- IV. The projected plans for 1974 are to first protect the four inch C & W system of our supply lines and other sections as time permits. We do not have a detailed plan, section by section, as further specific studies are required.

Three Thousand Dollars (\$3,000) has been budgeted for corrosion control capital additions but a minimum of \$3,000 additional will be spent on routine surveys, rechecking of the system, and anode installation for hot-spot protection when repairing leaks. The operational expenses are included in other general expense accounts.

Very truly yours,
L. E. Jirikovec
Assistant Vice President – Operations

United Cities Gas Company
1200 Parkway Towers
404 James Robertson Pkwy
Nashville, Tenn 37219

July 7, 1975

Mr. R. J. Nery, Chief Engineer
State of North Carolina
Utilities Commission
Raleigh, North Carolina 27607

Dear Mr. Nery:

In response to your letter of May 30, 1975, regarding the cathodic protection program in Hendersonville, North Carolina, the following report is submitted:

Distribution Mains

Coated Steel	74 miles
Bare Steel	24 miles
Plastic	<u>11 miles</u>
Total System	109 miles

Cathodic Protection of Mains

Presently under protection (some potentials are low and work is 'being done to clear shorts)	44 miles
To be protected in 1975	<u>9 miles</u>
Total under protection end of 1975	53 miles
Planned to bring under protection by end 1976	<u>21 miles</u>
TOTAL PROTECTED	74 miles

Discussion:

Attached is a copy of a pipe-to-soil potential read sheet which is used for recording of test data. Two men have been assigned the responsibility for updating these sheets as mains are added or replaced. Each man is equipped with a CP-20 meter. They share a Nillson short locator.

Our maps are designed to show location of insulators, anodes, valves, coated and wrapped mains, bare Mains, plastic mains, and date of installation when Available. Areas under protection are shown on the map and the read sheets have been documented from the map. Pipe-to-soil potentials are read to determine the condition of protection on the main. Any mains showing low potential are surveyed with a Nillson short locator to locate and remove any short circuits such as defective meter insulators or underground metallic contacts.

On examination of past construction practices it has been determined that it is impractical to run meaningful electrical surveys on the twenty four miles of bare mains. These mains have been coupled together with both insulated and uninsulated couplings and no record has been kept of their location. Because of this, condition meaningful continuity surveys can not be conducted. In addition, for the last fifteen years, nine pound anodes have

been installed for "hot spot" protection and the current from these anodes have an adverse effect on the interpretation of any surveys. In order to overcome these problems, and to monitor these areas "Leak Progression Maps" have been prepared. Main leaks are posted to this map, color coded as to year, and symbolized according to classification. These areas are then surveyed by flame ionization. If active corrosion is not mitigated by the "hot spot" protection program these areas will then be scheduled for replacement with plastic pipe.

Service Lines

C & W steel services	
under protection	1199
Plastic service lines	499
Bare steel services	<u>1121</u>
Total	2819

A file of all, isolated service lines has been prepared. Ten percent of these lines will be read each year to comply with code requirements.

Other bare steel service lines will be brought under cathodic protection as the remaining coated and wrapped mains are brought under protection. In addition, many bare service lines will be replaced by plastic insert whenever maintenance is required on a leaking service line.

For the symposium to be held in Raleigh on September 30 and October 1 we will have three people in attendance.

Sincerely, yours,

L.E. Jirikovec

Assistant Vice President, Operations

192.457 (a)

- 1 . Coated mains installed prior to August 1, 1971.

Surveys are scheduled for the coated and wrapped main system, and emphasis will be placed on protecting the coated system.

192.457 (b)

- 2 . Bare mains installed prior to August 1, 1971.

Efforts will proceed in all reasonable ways to comply with this requirement within the time stipulated. All methods listed in (b) (3) will be utilized. Our leak progression maps, which pictorially record areas of concentrated corrosion will be particularly valuable.

BEFORE THE
NORTH CAROLINA UTILITY COMMISSION
RALEIGH, NORTH CAROLINA

IN THE MATTER OF:

PETITION OF UNITED CITIES GAS COMPANY FOR AN EXTENSION OF TIME TO COMPLY WITH THE SAFETY STANDARDS AS SET FORTH IN TITLE 49, PART 192-TRANSPORTATION OF NATURAL AND OTHER GAS BY PIPELINE; SUBPART I, REQUIREMENTS FOR CORROSION CONTROL.

I.

The full name, address, and telephone number of the Petitioner is as follows:

L.E. Jirikovec, Vice President, Operations
United Cities Gas Company
1200 Parkway Towers
404 James Robertson Parkway
Nashville, Tennessee 37219
615-244-3766

II.

Gas operator's facilities are located in Hendersonville, North Carolina consisting of 110 miles of distribution main of 6" size and smaller, pressures ranging from 200 psig to 25 psig. System consists of bare steel, coated and wrapped steel and PE2306 plastic.

The breakdown of the distribution system which operates at 25 psig and 50 psig in Class 3 location is as follows:

Main Size	Feet
¾" steel	327
¾" plastic	130
1" steel	195
1 ¼" steel	6462
1 ¼" plastic	6535
1 ½" steel	234
2" steel	390339
2" plastic	62170
3" steel	23475
3" plastic	3537
4" steel	37974
6" steel	<u>5906</u>
TOTAL	538284

In addition there is 42' of 2" steel main and 44106' of 4" steel coated and wrapped main which has an MAOP of 200 psig in a Class 3 location.

There are 2857 service lines of bare steel, coated and wrapped steel, and P.E. 2306 plastic.

III.

The regulation involved in the waiver is section 192.457(b) of Part 192, Subpart I, Requirements of Corrosion Control, and specifically the requirements of having all bare or coated distribution mains under cathodic protection by August 1, 1976.

IV.

In accordance with the appropriate rules and regulations the petitioners request an extension of time for compliance with Section 192.457(b) as referenced in Section III, such extension to be to a date not later than August 1, 1979.

V.

The reasons for justification of the Petitioners waiver are as follows:

- (a) Because of the complexity of the system it has been physically impossible to meet all the requirements by August 1, 1976. The Petitioner is now well organized as explained under Section VI and a great deal of progress has been made in complying with the code requirements. The Petitioner simply needs more time in which to comply.
- (b) The proposed requested waiver will not be inconsistent with public safety as Petitioner has and will continue to operate the utility in a safe manner. Routine leakage surveys are conducted as required, gas is odorized in accordance with generally accepted criteria, a public information program is in effect so that people can recognize and report any gas odors, and all other provisions of the code are being complied with.

VI.

The Petitioner is primarily a gas distribution company serving approximately 50,000 customers in the States of Illinois, Tennessee, North Carolina, South Carolina, Georgia and Virginia. The system dates from 1930 although the majority of construction occurred after World War II. Construction consists of bare steel, coated and wrapped steel, and plastic. It has been joined by welding, insulated and uninsulated couplings, and in some cases by screwed joints. Plastic joints are made by socket fusion. Some bare steel was used through 1964. In 1965 coated and wrapped steel pipe was specified for all mains and service lines. Plastic pipe was brought into the system in 1973.

In order to comply with Subpart I, it was necessary for Petitioner to redraw all existing maps to a scale of 1"=200'. It was necessary to research all past construction records in order to accurately post distribution mains and appurtenances to the maps. Posted to the maps are relative locations of anodes, specific location of valves, couplings, type of pipe, date of installation and other pertinent data. It was virtually impossible to protect our systems without the use and reference to these new maps.

It was also necessary for us to organize a corrosion department incorporate in Engineering. The department now includes one Corrosion Specialist, and one Corrosion Technician, both certified by NACE. In addition there are now three field supervisors working on cathodic protection on virtually a full time basis. Each are studying the NACE Home Study Course and are expected to be certified as Corrosion Technicians by NACE within two years. In some local properties a trained serviceman is equipped with a volt meter, a current interrupter, and a pipe and cable locator so as to enable him to do the annual routine testing as required by the code.

On July 26, 1974, the Tennessee Public Service Commission issued a memorandum to all Tennessee gas utilities stating that for pipelines installed prior to August 1, 1971 "an analysis of corrosion related leak history" may be used to show whether or not hot spot protection is required. This memorandum was relied on as a valid interpretation to Section 192.457(b), in that leak detection surveys could be utilized rather than electrical surveys. Leak progression maps, showing areas where leakage had occurred, were posted so as to enable us to monitor areas of "active corrosion". Leak surveys were conducted in these areas. However, on January 24, 1976 the Department of Transportation, Office of Pipeline Safety Operations ruled that the only letter from Tennessee was misleading and that electrical surveys would be required where practical and where impractical the study of corrosion and leak history records can be used. Regrettably, our progress of cathodic protection of mains was influenced by the letter of memorandum from the Tennessee Commission.

Summary of Facilities and Protection

<u>Year</u>	<u>Total Miles of Main</u>	<u>Total Miles C&W</u>	<u>Miles C&W Protected</u>	<u>Miles Plastic</u>	<u>Miles Bare Steel</u>	<u>Miles Bare Steel Retired</u>
1971	93	64	30	0	29	1
1972	98	70	35	1	27	1
1973	105	74	41	5	26	1
1974	109	74	41	10	25	1
1975	110	76	44	11	23	2
6-1-76	110	76	52	13	21	2

In addition to the progress shown through 6-1-76, which represents 69% of the coated and wrapped steel distribution system under protection, a rectifier is now on order which will be used to protect an additional nine miles of distribution main which has an MAOP of 200 psig. The rectifier was to have been installed in 1975 but difficulty was experienced in getting ROW for a ground bed location. With the installation of the rectifier 61 miles of coated and wrapped steel will be under protection. This is 81% of the total coated and wrapped which will be protected.

The remaining 14 miles of coated and wrapped consists of sections from 100' in length to sections of 2000 or 3000 feet in length. This remaining portion will be the most difficult and costly to protect as it will be necessary to isolate these sections by insulating couplings or other devices from bare mains and to remove all external shorts. It will be a slow procedure.

In the last five years 8 miles of bare steel main have been replaced with either coated and wrapped steel, which is now under protection, or plastic pipe.

The bare steel mains will be the most difficult, time consuming, and expensive to protect. The majority of these lines have no continuity and electrical surveys are not practical. For the last fifteen years "hot spot" protection has been used on these lines and electrical readings would be influenced by the anodes. In addition, many of the lines are under concrete. This section of main is one area where an analysis of leak history can be used to monitor leakage and leak progression maps will be maintained to facilitate such surveys.

It is difficult to determine precisely how many dollars have been expended since 1972 on cathodic protection. Costs for installing cathodic protection have been included in capital costs of main and service line construction. Such costs are not handled as a separate accounting entry. Required annual survey costs are charged to maintenance expense of mains and services. The installation of insulators to existing and new meter sets are charge to capital costs of "meter installation". It is apparent from the efforts expended in the cathodic protection program that many thousands of dollars have been spent. Based on past performance it is estimated that \$150,000 has been spent on this program.

VII.

The Petitioner expects to continue his efforts to improve the cathodic protection on the system. As good Corrosion Department has been organized, detailed maps are now available to facilitate the installation of such protection, leak progression maps have been established to monitor areas of active corrosion, and hydrogen flame ionization surveys are conducted over these areas.

For 1976 a sum of \$7,500 has been budgeted for installation of a new rectifier and other capital costs. It has been estimated that there will be additional costs of maintenance to the existing system of \$20 - \$25,000 per year.

Specifically, the following plans will continue to be followed to improve the system:

1. Main replacement of bare mains will continue where condition so warrant.
2. Cathodic protection surveys will be made on an annual basis as required.
3. Insulating of meter sets will continue and other discovered shorts will be eliminated.

4. "Hot Spot" protection will be applied wherever active corrosion is discovered.

Attached is a copy of Section IV, Bulletin #7, from the Petition's Construction and Repair Manual which describes the procedure to be used to monitor cathodic protection activities in each location.

VIII.

For reference, there is attached the following instructions to Field personnel:

Bulletin #1	Cathodic Protection
Bulletin #2	Service Riser Anodes
Bulletin #3	Magnesium Anodes
Bulletin #4	Thermit Weld Process

PREMISES CONSIDERED, PETITIONERS PRAY:

- 1) That PETITIONERS be granted an extension of time for compliance with section 192.457(b) of the Natural Gas Pipeline Safety Act, said extension to be of a date not later than August 1, 1979.

Respectfully Submitted,
L.E. Jirikovec
Vice President, Operations

SUBJECT: Cathodic Protection of Mains, Services, Replacements, and areas of Corrosion.

Definition: Cathodic protection is a means of preventing corrosion on gas lines by use of magnesium anodes or rectifiers.

General Specifications:

1. Cathodic protection shall be installed during construction of all new mains and service installations. Cathodic protection shall also be applied as "hot spot" protection when repairing corrosion leaks.
2. In general, magnesium anodes will be used for cathodic protection. The Engineering Department will determine when a rectifier installation is necessary.
3. All new main installations shall be insulated at approximately 3,000 foot intervals.
4. Insulate all coated and wrapped mains which are connected to bare mains. The insulator should be on the bare main.
5. Insulate all coated and wrapped mains that are connected to cast iron mains.
6. All anodes and insulators installed on main installations are to be shown on the town master map.
7. On transmission mains anodes shall be installed by the thermit weld process. On distribution mains they may be brazed to the line although thermit welding is preferred.
8. An anode shall not be installed closer than 10 feet to an insulated coupling on main construction and on service lines if practical.
9. All service lines are to be insulated at the meter.
10. All anodes and insulators installed on service lines are to be shown on the service line history card.
11. Underground metallic contact with foreign pipelines must be prevented. Any that are found must be eliminated.

Construction Specifications for Cathodic Protection

I. MAINS

A. New Installations

1. For 2" and 3" mains install one 17# anode every 500 feet.
2. For 4" and 6" mains install one 17# anode, every 400 feet.
3. Insulate at approximately 3,000 foot intervals.
4. Insulate all distribution mains from high; pressure supply lines.
5. Carefully check the town master map when installing new mains so as to determine location of insulating fittings and anodes..

B. Replacements of Mains

1. Insulate coated and wrapped mains from bare mains.
2. Use anodes for protection as required.
3. If replacing a section of C&W main due to construction damage, tie the replacement in by welding or use non-insulating couplings. Install anodes in accordance with standard spacing. In cases such as this, reference will have to be made to the MASTER MAP to determine if additional anodes are required.
4. Old bare main is to be replaced with C&W pipe which, will be connected to the remaining bare main with insulated couplings. Anodes will be used for cathodic protection. On future replacements in the same area insulators should be removed when possible. This is in line with eventually having 3,000 foot sections under protection. Engineering should be notified by use of UC 235 whenever insulators or line stopper fittings are removed from the system.

II. SERVICES

A. New Installations

1. 3/4" Service Lines

a. Connected to Bare Mains

Use a service riser anode for protecting new 3/4" C&W service lines connected to bare mains. A 3/4" 1590-106 Style 90 Tap-N-Valve Weld Tee or a 2" x 3/4" 2030-022 Style 88 service connector, each with an insulated compression outlet can also be use. Refer to C&R, Section III, Bulletin No. 2 for instructions on the use of the service riser anode.

b. Connected to C&W Unprotected Mains

Use a service riser anode for protecting new 3/4" C&W service lines connected to unprotected C&W mains. A 3/4" 1590-107 Style 90, Tap-N-Valve Tee or a 2" x 3/4" 2031-028 Style 88 service connector, each with a non-insulating compression outlet shall be used.

c. Connected to C&W Protected Mains

New 3/4" services tied, into protected mains will be catholically protected by the anodes on the main. Do not insulate these services from the main. Do not use a service riser anode. Use the same valve tees as listed under (b).

2. 1/4" and 2" Service Lines.

a. Connected to Bare Mains

For 1 1/4 and 2 inch C&W service lines being installed on bare mains, the service shall be insulated at the main by use of the Mueller H-17830 insulating curb valve tee or valve of similar design. A 3# magnesium anode will be installed on the service line to supply current for cathodic protection. The anode should be installed at least ten feet from the insulated valve tee.

b. Connected to C&W unprotected mains.

If the 1 1/4" or 2" service line is to be connected to C&W mains which are not cathodically protected, a Mueller H-17812 with non-insulating compression Outlet or Mueller H-17800 weld outlet will be used. A 3# magnesium anode will be installed on the service line to supply current for cathodic protection. Place the anode mid-point on the service line.

- c. Connected to C&W Protected Mains.

For 1 ¼ and 2 inch C&W service lines being installed on cathodically protected mains, a Mueller H-17812 with non-insulating compression outlet or Mueller H-17800 weld outlet will be used. No anode installation is necessary. A valve box should be installed when a curb valve tee is used. Valves of similar design by a different manufacturer can be used.

B. Service Line Replacements

1. Partial service line replacements of a bare service with C&W pipe will be done as follows:
 - a. Insulate at the point nearest the tap with a Style 90 insulated dresser coupling or one of similar design.
 - b. Use a non-insulated coupling or weld at the end closest to the meter.
 - c. Protect with a 3# magnesium anode locating the anode on the coated portion of the service line.
 - d. Coat and wrap all fittings and coat the bare line at least 12" from the points of connection.
 - e. If the replacement is due to construction damage the entire service line shall be retested in the same manner as a new service line.
2. For replacing a bare corroded service line riser, or moving the meter from inside to outside, construct as follows:
 - a. A service riser anode is to be used whenever possible on all 3/4" service lines. It shall be connected with a non-insulated coupling. Coat and wrap the coupling and at least 12" of the old service line.
 - b. If a service riser anode is not available and the line is larger than 3/4", the following procedure shall be used:
 - 1'. Connect C&W riser with a non-insulated coupling.
 - 2'. Install 1-3# magnesium anode on the bare section of the service line installed near the dresser. Coat and wrap the coupling and at least 12" of the old service pipe.
3. For replacing a section of C&W service line the following procedure shall be used:
 - a. The replaced section shall be connected by use of non-insulating couplings.
 - b. The service valve tee shall be excavated and the gas shall be turned off if the replacement is necessitated because of construction damage.
 - c. The service line shall be retested in the same manner as a new service line.

- d. If the service is connected to a C&W main under cathodic protection no anode shall be installed on the service line.
- e. If the service is connected to a C&W main not under cathodic protection a 3# anode shall be installed on the replaced section of the service.
- f. If the service is connected to a bare main, the service valve tee shall be insulated, and a 3# anode installed on the replaced section of the service line.

III. Repairs

A. CORROSION

- 1. Whenever a*corrosion leak is uncovered the main or service shall be wired brushed and thoroughly cleaned for a distance of 12" on either side of the leak.
- 2. A standard leak clamp shall be installed.
- 3. If the leak occurs on a main, a 9# anode shall be installed. If the leak is on a service line a 3# anode shall be installed.
- 4. The entire 24 inches of pipe shall be coated with Bitumastic 505 or Thick-N-Quick Mastic or other approved material.

IV. BRANCH SERVICE LINES

1. Connected to Bare Mains

The service will be insulated at the main and one service riser anode shall be used. If the total distance is over 150 feet two service riser anodes shall be used. If the line is 1 1/4" or 2" service a 3# anode shall be used.

2. Connected to C&W Unprotected Mains

Use a service riser anode on each service line.

3. Connected to C&W Protected Mains

Do not install a service riser anode. The services will be protected from the anodes on the main.

4. Branch Connected to Existing Bare Service Line

a. Insulate at branch connection.

b. Use a service riser anode.

5. Branch Connected to C&W Service Line

a. Do not insulate.

b. Use a service riser anode.

V. GAS LIGHT INSTALLATION FROM HIGH PRESSURE MAINS

Since copper tubing is used for the gas carrier pipe it is necessary to insulate from the steel service or main. For installations of gas lights from high pressure lines the following valve will be used:

#2600-015 Style 88 Dresser Tap-N--Valve Mini-Tee 1/2" Weld x 3/8" O.D. Compression outlet with insulating gasket.

See Original for graphs

SUBJECT: SERVICE RISER ANODE

REQUIREMENT:

Every new service line shall be cathodically protected.

METHOD OF PROTECTION:

For each 3/4 inch service line installed on bare mains or unprotected C&W mains, a service riser anode shall be installed. This consists of a 7 foot piece of 3/4" API-5L seamless pipe, threaded on one end, and beveled on the other end for welding or coupling to the service line. Located four inches from the welded end is an equivalent three pound magnesium anode which has been pressed on the pipe. The pipe is coated with CorBond. For protection of 1 1/4 " and 2" service lines refer to C&R Section III, Bulletin #1.

METHOD OF INSTALLATION:

Each "Service Riser Anode" shall be bent with a long radius tubing bender so that the stop cock will be located at a height of 18" to 24" above grade. This permits the installation of the meter set to be made by use of standard nipples.

SERVICE VALVE TEES:

1. When installing a coated and wrapped 3/4" service line to a bare main the Dresser 1590-106 Style 90, 3/4" Tap-N-Valve weld tee or the Dresser 2" x 3/4" 2030-022 Style 88, Service Connector shall be used. Each valve has an insulated compression outlet.
2. When installing a coated and wrapped service line to a coated and wrapped main a Dresser 3/4", 1590-107, Style 90 Tap-N-Valve weld tee or the 2" x 3/4" 2031-028, Style 88, Service Connector shall be used. Each valve has a non-insulating compression outlet. A service riser anode will not be used on cathodically protected mains.

ORDERING SERVICE RISER ANODES

Service riser anodes shall be order in quantities of 50 units is a standard bundle. They shall be ordered from:

General Corrosion Services
743 Lambert Drive
Atlanta, Georgia 30324

SUBJECT: Magnesium Anodes.

Installation Procedure:

- A. Anodes should be lifted by the top of the bag and not the wire. This will prevent breakage or damage to the anode lead wire.
- B. When foreign metal structures or one of our own mains not metallicity connected to the main under consideration are present, anodes should be installed on the side of the main away from foreign structures. Anodes should never be installed so that the foreign structures lies between the main and the anode.
- C. Anode shall be installed a minimum of 3' away from main, or a minimum of 1' below main. They should never be laid on top of the pipe. The dirt around the anode should be tamped firmly.

See Original for pictures and figures.

SUBJECT: Thermit Weld Process

Requirement: The thermit weld process is designed for attaching anodes and test wires to steel mains or other metallic structures. This process however should not be used near highly inflammable materials or on leaking gas lines. Gas leaks should be repaired before any welds are attempted.

Procedure:

1. The pipe must be cleaned down to bright metal by filing, scraping or hammering. Wipe off any dirt, oil or grime from the mentioned area.
2. Remove approximately 3" of insulation from the end of the anode wire and insert a standard copper sleeve. This sleeve should be crimped to the wire with pliers. The copper wire sleeve prevents the thermit from burning through the wire. Allow sufficient slack in the wire to overcome any strain on the cadweld.
3. Insert a tin disc in the graphite mold. Remove the cover from the powder cartridge and dump, don't pour the powder into the mold. Crimp the bottom of the cartridge to make sure all the fine powder is removed. This is the fuse powder and must be on top of the charge for ignition. Close the mold cover.
4. Make sure your feet are not under the weld in case of overflow of the molten metal. Ignite the powder with a flint gun. Remove the gun as soon as ignition starts. This will prevent combustion products from clogging the gun.
5. Remove mold and clean out slag from the mold with a screwdriver as soon as the weld has been completed.
6. Strike the weld with a hammer to remove the slag and to test adhesion. If the weld moves, remove and reweld.
7. Coat and wrap the weld with approved materials.

See original for pictures and figures.