

Folder #1
STATE OF MISSOURI

PUBLIC SERVICE COMMISSION

- | | |
|---|---------|
| 1. Motion To Establish Docket For Commission Acknowledgement And Approval of Pipeline Replacement Program | 2/8/91 |
| 2. Notice | 2/13/91 |
| 3. Laclede Gas Company's Cast-Iron Replacement Program | 6/21/93 |
| 4. Staff's Recommendation | 7/13/93 |
| 5. Order Approving Main Replacement Program | 8/27/93 |

**STATE OF MISSOURI
PUBLIC SERVICE COMMISSION
JEFFERSON CITY**

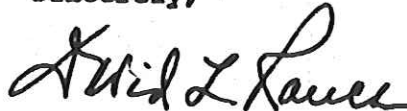
August 27, 1993

CASE NO: GO-91-275

Richard W. French, Assistant General Counsel, Laclede Gas Company,
720 Olive Street, St. Louis, MO 63101

Enclosed find certified copy of ORDER in the above-numbered case(s).

Sincerely,



David L. Rauch
Executive Secretary

Uncertified Copy:

Office of the Public Counsel, P.O. Box 7800, Jefferson City, MO 65102

STATE OF MISSOURI
PUBLIC SERVICE COMMISSION

At a Session of the Public Service
Commission held at its office
in Jefferson City on the 27th
day of August, 1993.

In the matter of the review and approval of cast)
iron main program for Laclede Gas Company.) CASE NO. GO-91-275

ORDER APPROVING MAIN REPLACEMENT PROGRAM

On May 1, 1990, Laclede Gas Company (Laclede) filed its cast iron replacement program pursuant to 4 CSR 240-40.030(15)(D). On February 13, 1991, the Commission established Case No. GO-91-275 to receive the cast iron main replacement program and to receive subsequent filings concerning said program. On June 21, 1993, Laclede filed a revised main replacement program. On July 13, 1993, the Staff of the Commission (Staff) filed a memorandum consisting of its recommendations regarding Laclede's revised main replacement program.

Staff stated that Laclede's program complies with the majority of subsection (15)(D), yet allows Laclede some flexibility to effectively schedule the necessary replacements. In addition, the program contains provisions that will result in the replacement of larger quantities of cast iron mains if the mains begin to experience increased fracture rates.

Staff indicated that Laclede has conducted an extensive records search of all historical fractures, updated its fracture maps and established a computer database to implement the program. Staff also noted that Laclede's accelerated replacement of cast iron mains in the 1960s and 1970s eliminated large quantities of cast iron mains that would be high priority replacements under the current regulations. Staff stated that while a few requirements will not be completely met, it believes that Laclede has adequately addressed such requirements in its program and has explained why the program's approach is appropriate.

For example, subparagraphs (15)(D)1.A. and B. require expedited replacement of all high-pressure cast iron mains beneath continuous pavement and/or near concentrations of the general public. Laclede's program provides an expedited schedule for the small remaining amounts of six-inch diameter mains. The program explains that expedited replacement for ten-inch diameter and larger mains is not justified because of the low fracture potential for the larger mains. Laclede has agreed to conduct semi-annual patrols of the ten-inch diameter and larger mains. Staff stated that it believes Laclede's approach is prudent.

Also, subparagraphs (15)(D)1.C. and G. require expedited replacement of all cast iron mains that are small diameter and/or which exhibit a history of fractures or graphitization. Laclede's program provides an expedited schedule for all small diameter mains that operate at high pressure and provides for replacement of low-pressure cast iron mains based upon the number of fractures and other criteria contained in the program. Staff indicated that the majority of the fracture criteria replacements will be of small diameter because small diameter mains have a greater fracture potential. Staff stated that this approach is appropriate because the potential for hazard is considerably less for distribution systems that operate at low-pressure and the provisions in the program will require the amount of replacement to increase if the fracture rate increases.

Staff recommends that the Commission approve Laclede's revised main replacement program. Staff notes that Laclede indicates a preference to commence its program on October 1, 1993, the beginning of its fiscal year, and that Staff has no objection to the program commencing on that date.

Upon review of Laclede's revised main replacement program and Staff's recommendation, the Commission finds that Laclede's revised program adequately addresses the requirements contained in 4 CSR 240-40.030(15)(D). The Commission

also finds that October 1, 1993, the beginning of Laclede's fiscal year, is a reasonable point at which to commence the program. Thus, the Commission determines that Laclede's revised main replacement program is reasonable and should be approved.

IT IS THEREFORE ORDERED:

1. That Laclede Gas Company's revised main replacement program as contemplated by this Order is hereby approved.
2. That the main replacement program approved in Ordered Paragraph 1 shall commence on or before October 1, 1993.
3. That this Order shall become effective on September 8, 1993.

BY THE COMMISSION



**David L. Rauch
Executive Secretary**

(S E A L)

**Mueller, Chm., McClure, Kincheloe,
and Crumpton, CC., Concur.
Perkins, C., Absent.**

Anthony - Lucia

CASE NO. GC-91-275

Am

Chairman

KL

Commissioner

absent

Commissioner

PK

Commissioner

DA

Commissioner

4-0 AD

3.1504c

Lucia 8/25

STATE OF MISSOURI

OFFICE OF THE PUBLIC SERVICE COMMISSION

I have compared the preceding copy with the original on file in this office and I do hereby certify the same to be a true copy therefrom and the whole thereof.

WITNESS my hand and seal of the Public Service Commission, at Jefferson City, Missouri, this 27th day of August, 1993.

David L Rauch

**David L. Rauch
Executive Secretary**

MEMORANDUM

FILED
JUL 13 1993
MISSOURI
PUBLIC SERVICE COMMISSION

TO: Missouri Public Service Commission Official Case File
Case No. GO-91-275
Laclede Gas Company

FROM: John D. Kottwitz and Robert R. Leonberger *RRL/jm*
Energy Department - Gas Safety

SUBJECT: Staff's Recommendation for Approval of the Cast Iron Replacement
Program Filed on June 21, 1993

DATE: July 9, 1993

Reviewed By: *San Mohammed 7/15/93* *Penny G Baker 2/17/93 7/12/93*
Utility Operations Division/date General Counsel's Office/date

Subsection (15)(D) of 4 CSR 240-40.030 required each natural gas operator in the State to develop a cast iron replacement program to be submitted with an explanation to the Commission by May 1, 1990, for review and approval. Laclede Gas Company (Laclede) originally submitted its cast iron replacement program on May 1, 1990. Case No. GO-91-275 was established for receipt of Laclede's cast iron replacement program and for receipt of subsequent filings concerning this program. Extensive discussions between Laclede and the MoPSC Gas Safety Staff (Staff) culminated in the cast iron replacement program that was filed by Laclede on June 21, 1993 (PROGRAM). The PROGRAM contains numerous revisions to the original program submitted by Laclede.

The Staff has determined that the PROGRAM is in compliance with the majority of subsection (15)(D), yet allows Laclede some flexibility to efficiently schedule the necessary replacements. In addition, the PROGRAM contains provisions that will result in the replacement of larger quantities of cast iron mains if the mains begin to experience increased fracture rates. Laclede has conducted an extensive records search of all historical fractures, updated its fracture maps, and established a computer database to implement the PROGRAM. Also, Laclede's accelerated replacement of cast iron mains in the 1960's and 1970's eliminated large quantities of cast iron mains that would be high priority replacements under the current regulations. There are a few requirements that will not be completely met, but the Staff believes that Laclede has adequately addressed these requirements in the PROGRAM and has explained why the PROGRAM's approach is appropriate. These requirements are discussed below.

Subparagraphs (15)(D)1.A. and B. - Requires expedited replacement of all high-pressure cast iron mains beneath continuous pavement and/or near concentrations of the general public. The PROGRAM provides an expedited schedule for the small remaining amounts of six-inch diameter mains in these two categories, and explains why expedited replacement is not justified for the ten-inch diameter and larger mains in these two categories. The Staff agrees that the fracture potential for these larger mains is low, as evidenced by Exhibits 2 and 3, which were attached to the PROGRAM. Laclede has agreed to conduct semi-annual patrols of the ten-inch diameter and larger mains in these categories

4.

X

(which represents a small amount at about 2.5 miles). Considering these added patrols and the other items listed in the PROGRAM, the Staff believes Laclede's approach is prudent.

Subparagraphs (15)(D)1.C. and G. - Requires expedited replacement of all cast iron mains that are small diameter and/or which exhibit a history of fractures or graphitization. The PROGRAM provides an expedited schedule for all small diameter mains that operate at high-pressure (about five remaining miles of six-inch diameter mains), and provides for replacement of low-pressure cast iron mains based upon the number of fractures and other criteria contained in the PROGRAM. Since small diameter mains have a greater fracture potential, the vast majority of these fracture criteria replacements will be small diameter. The Staff agrees that this approach is appropriate because the potential for hazard is considerably less for distribution systems that operate at low-pressure, and the provisions in the PROGRAM will require the amount of replacements to increase if the fracture rate increases.

In addition to the PROGRAM, Laclede filed a response in Case No. GS-91-267 on July 30, 1991, that states:

The Company's cast iron replacement criteria has and will continue to give a higher priority, all other things being equal, to those mains within areas of debris/fill.

Recommendation:

The Staff recommends that the Commission approve the PROGRAM filed by Laclede on June 21, 1993. On page 6 of the PROGRAM, Laclede indicates a preference to commence the PROGRAM at the beginning of its fiscal year, which starts October 1, 1993. The Staff has no objection to the PROGRAM commencing at the beginning of Laclede's fiscal year.

copies: Director-Utility Operations Division
Director-Policy & Planning Division
Assistant to the Director-Utility Services Division
Manager-Financial Analysis Department
Manager-Accounting Department
Manager-Energy Department
Office of the Public Counsel
Richard W. French (Laclede)
J. Gerald Hofer (Laclede)

Laclede Gas Company
City of St. Louis
Land Clearance for Redevelopment Authority
Major Urban Renewal Projects

<u>Name of Project</u>	<u>Year Started</u>	<u>Mileage C.I.</u>
Plaza Square	1953	1.3
Mill Creek Valley	1958	6.0
Kosciusko	1959	3.4
Civic Center (Stadium)	1961	1.4
Grandel	1964	1.3
West End	1964	4.8
DeSoto - Carr	1969	1.4
LaSalle - Park	1969	1.6
Murphy - Blair	1969	0.8
Convention Plaza	1974	0.8
Dr. M.L. King Ind. Park	1975	1.5
Washington U. Med. Ctr.	1975	1.9
St. Louis Centre	1978	1.0
Mill Creek North	1981	<u>1.2</u>
	TOTAL	28.4

**LACLEDE GAS COMPANY
CAST IRON MAIN BREAKS
BREAKS PER MILE PER YEAR VS. SIZE**

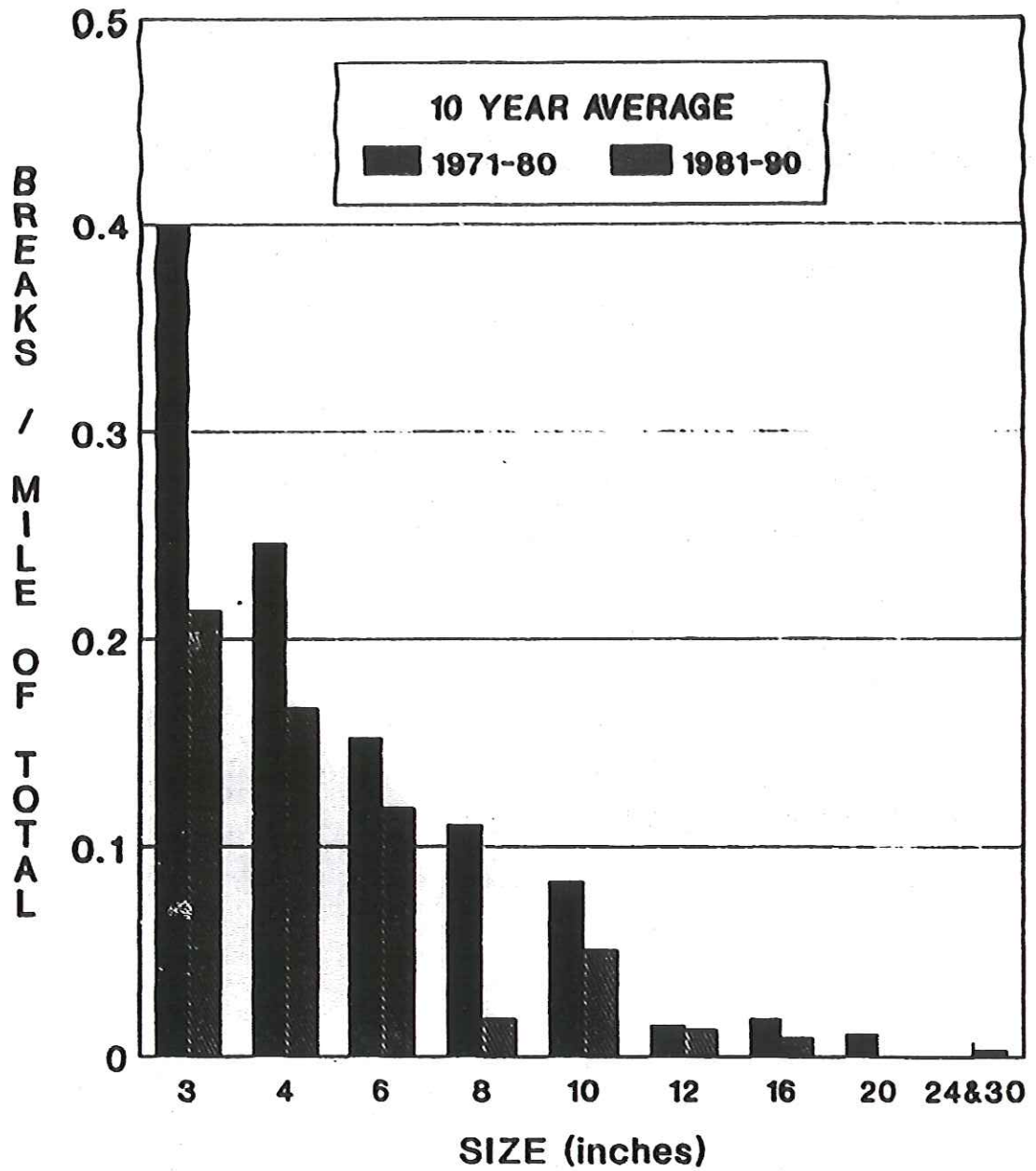


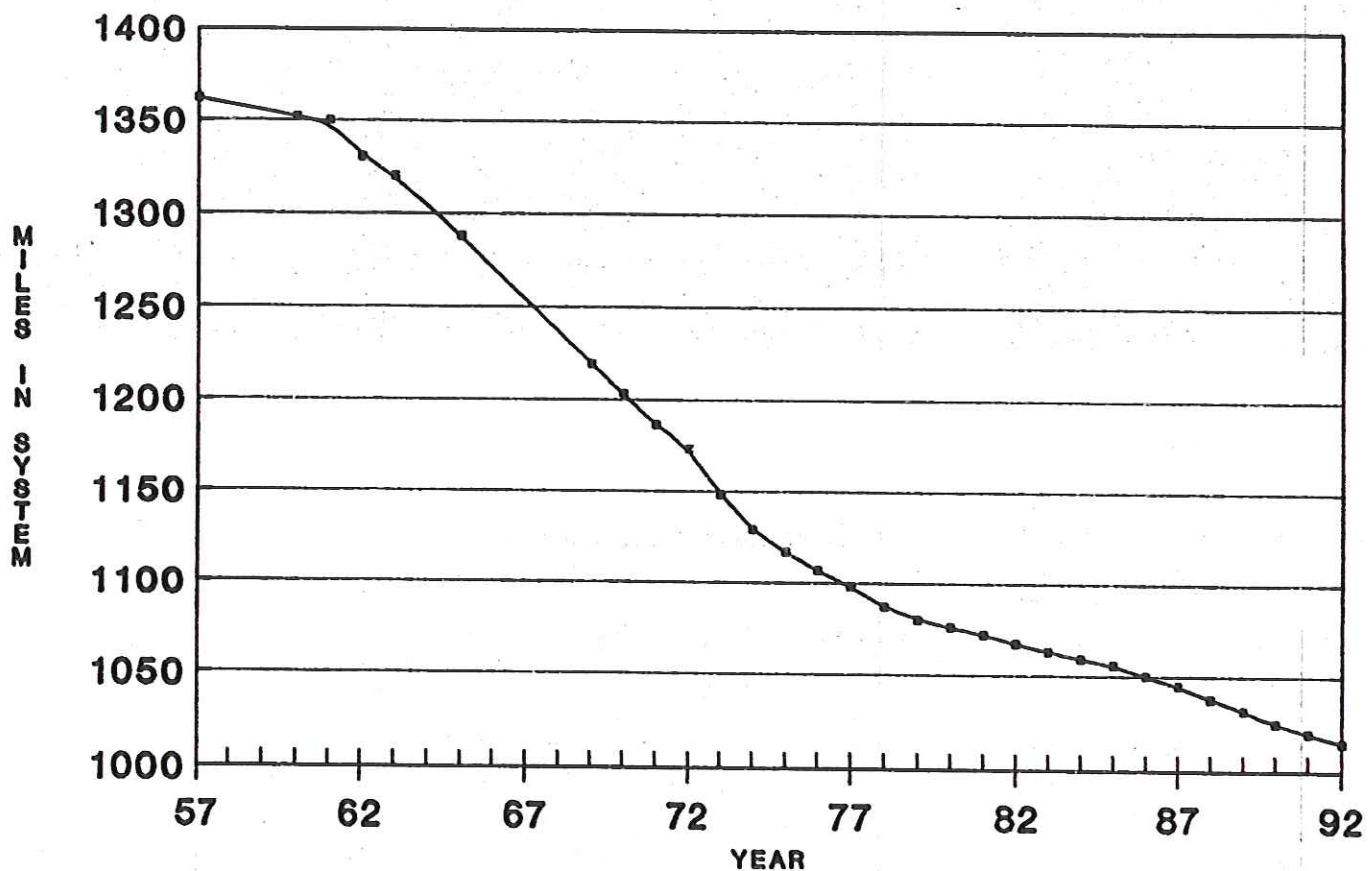
EXHIBIT 2

**LACLEDE GAS COMPANY
CAST IRON BROKEN MAIN SUMMARY**

CALENDAR YEAR 1970 - 1992

C.Y.	3"	4"	6"	8"	10"	12"	16"	20"	24" & 30"	TOTAL
70	13	148	93	1	5	3	0	0	0	263
71	12	158	113	2	2	3	0	0	0	290
72	6	114	83	6	1	0	0	0	0	210
73	4	82	60	1	3	1	0	0	0	151
74	2	95	55	0	2	1	1	1	0	157
75	3	82	43	0	3	0	0	0	0	131
76	6	86	67	1	2	3	0	0	0	165
77	9	131	111	5	4	5	0	0	0	265
78	4	76	66	0	2	1	0	0	0	149
79	2	73	84	0	4	2	2	0	0	167
80	1	66	64	0	2	3	0	0	0	136
81	4	57	53	0	3	1	0	0	0	118
82	0	89	67	0	2	4	0	0	0	162
83	1	42	35	0	3	1	0	0	0	82
84	0	77	82	0	2	1	2	0	0	164
85	1	82	76	0	1	3	0	0	0	163
86	6	51	49	0	1	3	0	0	0	110
87	6	40	48	1	1	2	0	0	0	98
88	1	53	45	0	0	1	0	0	1	101
89	3	50	43	0	1	0	0	0	0	97
90	0	48	47	1	0	0	0	0	0	96
91	2	31	41	0	0	3	0	0	0	77
92	0	29	28	0	0	0	0	0	1	58

LACLEDE GAS COMPANY
TOTAL CAST IRON MAINS IN SYSTEM
AT END OF YEAR FOR
1957 - 1992



BEFORE THE PUBLIC SERVICE COMMISSION
OF THE STATE OF MISSOURI

In the matter of the review and approval of the) CASE NO. GO-91-275
cast iron main program for Laclede Gas Company.)

NOTICE

Donald L. Godiner, General Counsel and Vice President, Laclede Gas Company,
720 Olive Street, St. Louis, Missouri 63101
William M. Shansey, Assistant General Counsel, Missouri Public Service Commission,
P. O. Box 360, Jefferson City, Missouri 65102

Uncertified copy to:

Office of Public Counsel, P. O. Box 7800, Jefferson City, Missouri 65102

Case No. GO-91-275 has been established for receipt of the cast iron main
program for Laclede Gas Company and for receipt of subsequent filings concerning this
program.

BY THE COMMISSION

Brent Stewart

Brent Stewart
Executive Secretary

(S E A L)

Dated at Jefferson City, Missouri,
on this 13th day of February, 1991.



Missouri Public Service Commission

Commissioners:

WILLIAM D. STEINMEIER,
Chairman

ALLAN G. MUELLER

DAVID L. RAUCH

KENNETH McCLURE

RUBY L. LETSCH-RODERIQUE

POST OFFICE BOX 360
JEFFERSON CITY, MISSOURI 65102
314 751-3234
314 751-1847 (Fax Number)

February 8, 1991

ROBERT J. SCRIBNER,
Staff Director
GORDON L. PERSINGER,
Director, Utility Division
MARY ANN YOUNG,
General Counsel
C. GENE FEE,
Chief Hearing Examiner
HARVEY G. HUBBS,
Secretary

See

Mr. Charles Brent Stewart
Executive Secretary
Missouri Public Service Commission
P.O. Box 360
Jefferson City, Missouri 65102

RE: Case No. GO-9/275 -- In the matter of the Review and Approval of the Cast Iron Main Program for Laclede Gas Company.

Dear Mr. Stewart:

Enclosed for filing by the Commission Staff in the above-captioned case is an original and fourteen (14) copies of a MOTION TO ESTABLISH DOCKET FOR COMMISSION ACKNOWLEDGEMENT AND APPROVAL OF PIPELINE REPLACEMENT PROGRAM. Copies have been sent this date to all parties of record.

Thank you for your attention to this matter.

Sincerely yours,

William M. Shansey

William M. Shansey
Assistant General Counsel

WMS:rsn

Enclosures

cc: Parties of Record

FILED

FEB 8 1991

PUBLIC SERVICE COMMISSION

BEFORE THE PUBLIC SERVICE COMMISSION
OF THE STATE OF MISSOURI

In the matter of the Review and)
Approval of the Cast Iron Main)
Program for Laclede Gas Company.)

Case No. GO-91-275

MOTION TO ESTABLISH DOCKET FOR COMMISSION ACKNOWLEDGEMENT
AND APPROVAL OF PIPELINE REPLACEMENT PROGRAM

Comes now the Staff of the Missouri Public Service Commission ("Staff") and for its Motion states as follows:

1. Commission Rule 4 CSR 240-40.030(15)(D), adopted by order of this Commission effective December 15, 1989, required the operators of natural gas transportation systems in the State of Missouri having facilities which contain cast iron transmission lines, feeder lines or mains to establish and submit replacement programs to this Commission by May 1, 1990 for Commission review and approval.

2. In compliance with this rule, Laclede Gas Company ("Laclede") submitted its program to this Commission for review and approval. A copy of this program is attached and hereby incorporated by reference as Staff's Exhibit 1.

3. On December 27, 1990, after reviewing all programs submitted by operators in the State of Missouri in compliance with the Commission rules, Staff submitted its Motion to Establish Docket for Commission Acknowledgement and Approval of Pipeline Replacement Programs.

4. In paragraph 6.e. of Staff's Motion, Staff stated its intention to seek the establishment of separate dockets for review and acceptance of the submitted programs of certain

operators with whom Staff continued to work concerning certain items in their programs.

5. Staff is continuing to work with Laclede concerning certain items in its submitted program.

6. Staff therefore moves this Commission to establish a docket to receive KPL's cast iron main program, Staff's ultimate recommendation and the Commission's review and subsequent order concerning approval.

WHEREFORE the Staff of the Public Service Commission respectfully requests this Commission issue its order establishing a docket for the receipt of the cast iron main and program of Laclede Gas Company and for receipt of subsequent filings concerning this program.

Respectfully submitted,

William M. Shansey

William M. Shansey
Assistant General Counsel

Attorney for the Staff of the
Missouri Public Service Commission
P. O. Box 360
Jefferson City, MO 65102
314-751-8702

CERTIFICATE OF SERVICE

I hereby certify that copies of the foregoing have been mailed or hand-delivered to all parties of record on this 8th day of February, 1991.

William M. Shansey

RECEIVED

**LACLEDE GAS COMPANY
SAINT LOUIS**

MAY 1 1990

**UTILITY DIVISION
P. S. C. MO.**

**3950 FOREST PARK BOULEVARD
ST. LOUIS, MISSOURI 63108**

**314/658-5479
FAX No. 314/535-9414**

May 1, 1990

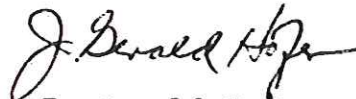
**W. R. Ellis
Pipeline Safety Program Manager
Missouri Public Service Commission
P.O. Box 360
Jefferson City, MO 65102**

**Re: 4 CSR 240-40.030(15)(B)-(E)
Replacement Program Filing**

Dear Mr. Ellis:

Pursuant to the requirements of 4 CSR 240-40.030(15)(B)-(E) of the Commission Rules ("Rules"), Laclede Gas Company ("Laclede") hereby submits the attached Written Replacement Programs ("Programs"). Such Programs are submitted herewith only for the purpose of compliance with the currently existing aforementioned Rules and for no other purpose. Such filing should not be construed as an acceptance of, or an acquiescence in, the substance of such Rules, any such acceptance or acquiescence being specifically withheld by Laclede. Furthermore, Laclede reserves all of its rights regarding such rules, including without limitation its right to petition the Commission to amend or rescind such Rules, to apply for waivers from such Rules and to otherwise take such action with respect to such Rules as Laclede deems appropriate in the circumstances.

Very truly yours,



**J. Gerald Hofer
Superintendent
Engineering and
Support Services**

LACLEDE GAS COMPANY

**PROPOSED REPLACEMENT PROGRAM FOR
CAST IRON PIPING
PURSUANT TO 4 CSR 240-40.030(15)(D)**

Section (15)D of the MoPSC's Safety Regulations requires that all operators who have cast iron pipe in their distribution systems develop and submit a systematic replacement program. The regulations specify that the program be prioritized to identify and eliminate that cast iron piping which presents the greatest potential for hazard. Seven high priority categories are identified in the regulations.

Laclede already has an effective maintenance and replacement program for cast-iron mains. The Company's program is based upon using a thirty to forty year history of leak repairs, main condition reports, age, soil condition, customer interruption problems, street paving projects as well as all criteria listed in the regulations.

Laclede's procedures to implement a cost effective cast-iron replacement program has achieved outstanding results. Major accomplishments are;

- 1) All 4" and smaller medium-pressure cast-iron mains have been replaced.
- 2) All cast-iron services have been replaced.
- 3) All 10" and larger medium pressure AGA bell and spigot cast iron joints have been reinforced with bell joint clamps.
- 4) Thirty-nine (39) miles of bell and spigot low pressure and medium pressure cast-iron mains were internally sealed between 1961 and 1970 in high maintenance areas and areas of continuous pavement.
- 5) All cast iron mains in the downtown area of the City of St. Louis have been replaced with the exception of one large diameter (24") main.
- 6) A total of 315 miles of cast iron main has been eliminated since the mid-1950's.

Laclede's cast-iron replacement program is based on on-going monitoring of the condition of cast-iron mains and is accomplished by the following practices and procedures:

- (1) Whenever a cast-iron main is exposed for any reason, a pipe condition report is submitted to the Maintenance Engineering Section.
- (2) Whenever a cast-iron main is repaired, a pipe condition and repair report is submitted to Maintenance Engineering.
- (3) All cast iron main breaks are reported to Maintenance Engineering on a specially designed Cast Iron Broken Main Report.
- (4) All repairs, breaks, and pipe condition reports are entered on maps of the cast-iron system.

- (5) All 6" medium pressure cast-iron mains are incorporated in a special study file which is reviewed periodically to determine priority for replacement.
- (6) All 4" and 6" low pressure cast iron mains with two or more breaks in 500 feet are placed in study files for monitoring and special review.
- (7) Information contained in the maintenance history file is supplemented on a current basis with reports from the field on service outages caused by water problems, freeze-ups and/or customer complaints.
- (8) Since 1962, flame ionization leak surveys have been conducted annually on the entire cast-iron system with additional special surveys conducted when weather/ground conditions are severe.

In view of the foregoing, Laclede plans to continue its present cast iron replacement program for the foreseeable future. We estimate this will consist of replacing approximately 40 miles of cast-iron main in the next ten (10) years in the following categories:

- 1) 3.5 miles of 6" medium pressure mains in continuous pavement areas and areas of public assembly such as schools, hospitals and business districts.
- 2) 4.0 miles of 4" and 6" low pressure cast-iron in break areas as indicated by existing study files.
- 3) 32.0 miles of various sizes of low pressure cast-iron mains in areas which are susceptible to breaks.

**LACLEDE GAS COMPANY
720 OLIVE STREET
ST. LOUIS, MO 63101**

AREA CODE 314
342-0630

RICHARD W FRENCH
ASSISTANT GENERAL COUNSEL

June 18, 1993

Mr. C. Brent Stewart
Executive Secretary
Missouri Public Service Commission
P.O. Box 360
Jefferson City, MO 65102

Re: Case No. GO-91-275

Dear Mr. Stewart:

Enclosed for filing on behalf of Laclede Gas Company please find the original and fourteen copies of Laclede Gas Company's Cast-Iron Replacement Program in the above-captioned cause. Please see that this filing is brought to the attention of the appropriate Commission personnel.

Please file-stamp the additional copy of such filing and return the same in the pre-addressed, stamped envelope provided.

Thank you for your consideration in this matter.

Sincerely,



Richard W. French

RWF:dv

Enclosures

cc: Office of the Public Counsel

FILED
JUN 21 1993
MISSOURI
PUBLIC SERVICE COMMISSION

FILED
JUN 21 1993
MISSOURI
PUBLIC SERVICE COMMISSION

BEFORE THE PUBLIC SERVICE COMMISSION
OF THE STATE OF MISSOURI

In the matter of the review and)
approval of the cast-iron main) Case No. G0-91-275
program for Laclede Gas Company.)

LACLEDE GAS COMPANY'S CAST-IRON REPLACEMENT PROGRAM

Comes now Laclede Gas Company ("Laclede"), by its counsel, and for the filing, and seeking approval, of Laclede's Cast-Iron Replacement Program ("Program") states that:

1. By its Order of Rulemaking in Case No. GX-89-220 filed with the Secretary of State of the State of Missouri on November 9, 1990, the Missouri Public Service Commission ("Commission") issued certain revised gas safety rules ("Rules"), including the Rules contained in 4 CSR 240-40.030. Commission Rule 4 CSR 240-40.030(15)(D) required that Laclede develop a replacement program for cast-iron transmission lines, feeder lines and mains, and submit said program to the Commission by May 1, 1990 for Commission review and approval.

2. On May 1, 1990, Laclede filed its initially Proposed Replacement Program for Cast-Iron Piping with the Commission. Subsequently, on February 8, 1991, the Commission Staff filed a Motion to Establish a Docket For Commission's Acknowledgment and Approval of Laclede's Cast-Iron Pipeline Replacement Program. In said Motion, the Commission Staff stated that it was continuing to work with

3.

X


Laclede concerning certain items in Laclede's initially Proposed Replacement Program for Cast-Iron Piping and requested that the Commission establish a docket to deal with Laclede's finally proposed Program, as well as the Commission Staff's recommendation and the Commission's subsequent order concerning approval of the Program.

3. By an Order dated February 13, 1991, the Missouri Public Service Commission established this docket for the receipt of Laclede's Program and for subsequent filings concerning the Program.

4. Laclede and the Commission Staff have held ongoing discussions concerning the ultimate content of Laclede's finally proposed Program. These discussions have resulted in the formulation of the Program which is attached hereto as Schedule 1, and is incorporated by reference herein for all purposes. The Commission Staff has indicated that it is in general agreement with the attached Program.

WHEREFORE, Laclede respectfully requests that the Commission issue an order approving the Program set forth in Schedule 1 hereto.

Respectfully submitted,


Richard W. French
Assistant General Counsel
Laclede Gas Company
720 Olive Street, Rm. 1517
St. Louis, Missouri 63101
314-342-0530

CERTIFICATE OF SERVICE

Richard W. French, Assistant General Counsel of Laclede Gas Company, hereby certifies that the foregoing Filing of Laclede Gas Company's Cast-Iron Replacement Program in Case No. GO-91-275 has been duly served upon the Office of the Public Counsel, Post Office Box 7800, Jefferson City, Missouri 65102 by placing a copy thereof in the United States mail, postage prepaid on this 18th day of June, 1993.



Richard W. French

Laclede Gas Company

CAST-IRON REPLACEMENT PROGRAM
PURSUANT TO 4 CSR 240-40.030(15)(D)

4 CSR 240-40.030(15)(D) of the MoPSC's Pipeline Safety Regulations ("Subsection (15)(D)") requires that all operators who have cast-iron pipe in their distribution systems develop and submit a systematic replacement program. The regulations specify that the program be prioritized to identify and eliminate that cast-iron piping which presents the greatest potential for hazard. Seven high priority categories are identified in the regulations.

Laclede formulated a systematic maintenance and replacement program for cast-iron pipe in the early 1950's. This program has been reviewed periodically and the priority criteria revised as necessary so as to replace and eliminate cast-iron pipelines that have a history of leaks and a potential for breaks.

Laclede's comprehensive Cast-Iron Maintenance, Monitoring, and Replacement Program in effect for the past forty years, has resulted in the following actions and policies:

1. Reinforcement by clamping or sealing of all AGA bell and spigot joints operating at medium pressure. (3 to 25 psig).¹
2. Prohibition of upgrading low pressure cast-iron mains to medium pressure.
3. Elimination of cast-iron mains not specifically required to maintain the capacity of the system.
4. Replacement or elimination of cast-iron mains in areas affected by heavy equipment, blasting, major demolition and/or urban renewal and development.
5. Annual flame-ionization mobile leak survey of all cast-iron mains with additional special surveys conducted when weather/ground conditions warrant.
6. A comprehensive report on the pipe condition, pipe environment, traffic loading, depth of cover, repair type, leak cause, etc. is originated for every

¹The MOPSC's Pipeline Safety Regulations solely defines "high" and "low" pressure distribution systems. Only Laclede's medium pressure distribution system contains cast-iron pipe which falls within the definition of a "high pressure" distribution system set forth in Section 4 CSR 240-40.030(1)(B)10.--namely one where the pressure is higher than an equivalent to 14 inches water column.

excavation where a cast-iron main is exposed. This report along with the maintenance history for that section of main is reviewed and evaluated by Maintenance Engineering to determine replacement requirements and priorities.

7. Replacement of all cast-iron service lines with the highest priority being schools, churches and buildings of public assembly.
8. Replacement or elimination of cast-iron mains affected by major street or highway construction, reconstruction, paving , or relocation.
9. Replacement or elimination of cast-iron main where construction activity that could have a detrimental effect due to vibration, settlement or added loading, occurs in close proximity.
10. Replacement or elimination of all cast-iron mains with unreinforced bell and spigot joints in the downtown City of St. Louis business district.
11. Replacement or elimination of 4-inch and 6-inch cast-iron medium pressure mains.

12. Replacement or elimination of cast-iron mains that have a history of breaks, leaks or graphitization.

The above long-standing policies and procedures for maintaining and replacing cast-iron pipelines have achieved outstanding results. Major accomplishments are:

1. Reinforcement by clamping or sealing of all 49 miles of AGA bell and spigot joints in the medium pressure system.
2. All cast-iron service lines have been replaced as a result of a program begun in 1961 to replace cast-iron and bare steel services to schools, churches, hospitals and other buildings of public assembly.
3. Replacement of all 8 miles of 4-inch and 5 miles of 6-inch medium pressure cast-iron mains.
4. Replacement of 30 miles of cast-iron low pressure mains in the downtown business area east of Twelfth St. (Tucker Blvd.) in the City of St. Louis.
5. Replacement or elimination of 28 miles of cast-iron mains in major urban renewal projects as shown on Exhibit 1.

The St. Louis Land Clearance for Redevelopment Authority approved 70 plans for urban redevelopment between 1953 and 1980, and over 340 plans since 1981. Most of these plans were reviewed by Laclede in the normal course of business for consideration of cast-iron main abandonment or replacement, providing service to the project, and relocation of existing facilities in conflict with the project but required for system integrity.

6. A significant reduction in the cast-iron break frequency during the 1980's as compared to the 1970's is shown in Exhibit 2. The statistical history of circumferential main breaks by size over the past 21 years is shown in Exhibit 3. As can be seen from these exhibits, the number and frequency of breaks on large-diameter cast-iron mains (8-inch and larger) is such that they do not warrant consideration for replacement based upon potential for breakage.

7. Elimination of a total of 331 miles of cast-iron mains from 1957 to 1990 as shown on Exhibit 4. As the curve on Exhibit 4 shows, Laclede's aggressive program eliminated large amounts of cast-iron with a leak/break history during the 1950's and 1960's. During the 1970's and 1980's, the rate of elimination slowed as the leak/break history of remaining cast-iron mains improved. It is important to point out that Laclede is

not now just beginning to develop a cast-iron replacement program, but we are continuing to implement and enhance a plan that is both cost-effective and comprehensive.

Laclede's Cast-Iron Replacement Program, which contains a Specific Priority Schedule, and an Ongoing and a Long-Term Program, will eliminate those high priority categories of cast-iron pipe identified in paragraph (15)(D)1. as presenting the greatest potential for hazard. Prioritization within the categories set out below will take into account all available information about the areas for replacement consideration. This information will reflect, but not be limited to, soil type and condition, traffic loading, depth of cover, operating pressure, leak cause, and pipe condition including indications of graphitization.

Provided that this program is approved by the Commission in a timely manner, such program's first year will begin with the commencement of Laclede's 1994 fiscal year on October 1, 1993, and will end with such fiscal year's conclusion on September 30, 1994. Successive program years will correspond with Laclede's fiscal year.

SPECIFIC PRIORITY REPLACEMENT SCHEDULE

This schedule applies to specific predetermined facilities that have been identified at the time of submission of this program.

- ✓ 1. Six-inch medium pressure cast-iron main located beneath pavement which is continuous to building walls will be replaced or eliminated within the first year of the program (approximately 0.5 miles).
2. Cast-iron low pressure main areas having three (3) or more breaks with at least one of these breaks occurring within the previous ten years will be replaced or eliminated within the first three years of the program (approximately 20.2 miles).
- ✓ 3. Six-inch medium pressure cast-iron main near concentrations of the general public will be replaced or eliminated within the first five years of the program (approximately 2.5 miles).
4. Cast-iron low pressure main areas having two (2) breaks, where at least one of these breaks have occurred within the last ten years, will be replaced or eliminated within the first eight years of the program (approximately 22.6 miles)

5. Cast-iron low pressure main areas having three or more breaks, all of which occurred more than ten years ago, will be replaced or eliminated within the first eight years of the program (approximately 6.3 miles).
6. All other 6-inch medium pressure cast-iron main will be replaced or eliminated within the first ten years of the program (approximately 2.1 miles).

Laclede's break history data for large diameter (10 inch and larger) cast-iron medium pressure mains in areas identified in subparagraphs (15)(D)1.A. and B. ("Categories A and B"), does not justify replacement of these mains for the following reasons:

1. Main Condition Reports are favorable.
2. Very low frequency of breaks on these types of Laclede mains.
3. Mobile leak surveys are conducted annually.

It is Laclede's position based on its experience and record of operating cast-iron distribution systems ranging in size from 3-inches to 30-inches, that small diameter cast-iron mains which have exhibited a history of breaks should receive a higher replacement priority than large diameter cast-iron

medium pressure mains which have no history of breaks, but are located in areas included in Categories A and B. Laclede believes that its replacement efforts should address those areas where experience indicates a higher probability of breaks, rather than areas in Categories A and B which specify general location conditions of perceived high risk without consideration of breakage potential.

Laclede will, however, institute semi-annual patrols of these large diameter, medium pressure mains in Categories A and B to supplement its annual mobile leak survey.

Special consideration will be given to replacement of any cast-iron medium pressure main section that should experience a break.

ONGOING REPLACEMENT PROGRAM

This schedule applies to facilities that are identified subsequent to the submission of this program.

1. Cast-iron low pressure main areas with two or more existing breaks will be replaced or eliminated within three years of the discovery of a new break.

2. Cast-iron low pressure main areas with one existing break will be replaced or eliminated within five years of the discovery of a new break.
3. Sections of cast-iron main will be replaced, as required, where extensive excavation, blasting or construction activities have occurred in close proximity to such main.
4. Sections of cast-iron main will be replaced as required by 4 CSR 240-40.030(13)(Z) ("Protecting Cast-Iron Pipelines").
5. Unspecified newly identified priority replacement sections or areas will be replaced or eliminated as required.

LONG-TERM REPLACEMENT PROGRAM

Laclede will continue cast-iron main replacements with special long-term replacement consideration given to the following:

- Cast-iron low pressure main areas with two existing breaks which occurred more than ten (10) years ago.

- **Cast-iron low pressure main areas with one break which occurred less than ten (10) years ago.**

- **Six-inch and smaller cast-iron low pressure mains under pavement which is continuous to building walls.**

- **Sections of cast-iron main which demonstrate significant graphitization.**

As stated previously, Laclede has already replaced its cast-iron service lines.