



CITY OF PROVIDENCE • RHODE ISLAND • Walter H. Reynolds • Mayor

Office of the Public Service Engineer

Peter J. Hicks, Jr.
Public Service Engineer

City Hall, Providence 3, R. I.

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February 3, 1954

The Honorable City Council
City Hall
Providence, Rhode Island

Gentlemen:

Resolution 43 of the City Council, Approved January 22, 1954, resolved that the Public Service Engineer be directed to

1. Determine the effect of Natural Gas upon present measuring mechanisms of gas meters presently used in the City of Providence.
2. Determine whether corrective steps, if any, be needed, have been put into effect by the Providence Gas Company.
3. Determine whether there is any need of City or State legislation to protect the consumer in respect to this matter.
4. Report to this Council as soon as the pertinent facts have been ascertained.

In compliance with said resolution, I, as the Public Service Engineer have held numerous conferences with officials of the Providence Gas Company. I have also discussed the matter with Mr. Thomas A. Kennelly, Public Utility Administrator for the State of Rhode Island and Mr. Homer R. Stickney, Utility Engineer for the State of Rhode Island.



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The effects of natural gas upon present measuring mechanisms on gas meters presently used in the City of Providence, cannot be immediately determined. Only a periodic changing and testing of meters over a reasonable period of time will indicate whether there is any appreciable change in the accuracy of meters in service following the arrival of natural gas in the system.

If any such changes should occur they will be gradual over a considerable period of time and will not occur on all meters immediately.

The Providence Gas Company is aware of the factors that have effected the accuracy of gas meters in some other cities following the arrival of natural gas. There is reason to believe that some of these factors are not present in our local situation because of the type of manufactured gas distributed previous to the arrival of natural gas.

On February 8, 1952, House resolution No. 688 was passed in the Rhode Island House of Representatives. This resolution requested the Administrator of Public Utilities to ascertain from officials of the Providence Gas Company the present condition of the leather diaphragms of gas meters now in service, to be assured that meters and improvements will be adequate to handle properly the flow of Natural Gas.

The resolution refers to reports that a considerable percentage of gas meters in Westchester County, New York, which operated correctly with manufactured gas, had been found to be running fast when registering the flow of Texas Natural Gas. It further mentions, that the leather diaphragms of those meters were not functioning correctly because Natural Gas is drier than manufactured gas.



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An investigation of the report of meter conditions in Westchester County, New York, showed that tests of 8,272 meters did indicate that 26% were running fast but did not show by what per cent they were fast beyond allowable limits or what per cent were slow on tests. The Westchester Lighting Company which distributes gas in Westchester County, New York, had not made any attempt to overcome the action of Natural Gas due to its relative dryness by conditioning it. In this respect their practice is at variance with that generally followed by the gas industry in those localities where Natural Gas has been introduced.

The Providence Gas Company changes consumer's meters periodically and tests 15% of the meters in service per year and make adjustments and repairs if necessary before they are returned to service. The cost of this program in 1951 was approximately \$155,000.

The engineers of the Providence Gas Company are aware of the experience with meters of other companies where Manufactured Gas has been replaced by Natural Gas. In some instances a greater than normal replacement of diaphragms have been found necessary immediately after the change than before Natural Gas was introduced. In practically all cases, however, the meters were more accurate and required less maintenance with Natural Gas after a period of two or three years, in which conditions in the system became stabilized.

It must be kept in mind that difficulties may be experienced with proper operation of leather diaphragms of gas meters whenever a change is made from one type of gas to another if there is a difference in the dryness of the two gases, as far as the presence of



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certain condensable oils is concerned. The leather in the diaphragms is originally treated with an oily dressing to keep them in a pliable condition. Condensable oils from certain types of manufactured gas tend to displace this original dressing material. The introduction of a drier gas may then remove the condensable oils deposited by the previous gas. Unless preventative steps are taken this may cause diaphragms to shrink, causing a "fast" meter. At the present time there is no evidence that natural gas has or has not affected gas meters in Providence in the above described manner. Officials of the Providence Gas Company have stated that original complaints after conversion averaged 14.5%. A card mailed to all consumers by the Providence Gas Company, requesting that they register complaints, resulted, in 7% more, making a total of 21.5% complaints since conversion. The company stated that poor adjustment, failure of pilot light and broken parts were the major causes of the complaints, and that complaints of higher bills were found to be due to improper adjustments by the conversion company.

The Providence Gas Company has taken measures to adjust high bills that were due to poor adjustment made during the conversion.

The Providence Gas Company, being aware of the factors which have affected the accuracy of gas meters in other cities converted to natural gas, have conditioned the natural gas by humidification and hot and cold oil "fogging". This is necessary because natural gas is dry and if not conditioned, would have a tendency to dry out the meter diaphragms, resulting in inaccurate readings. Providence Gas Company Officials feel



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that with the natural gas conditioned in this matter, the moisture content is comparable to the manufactured gas formerly distributed in Providence.

If Natural Gas is properly conditioned and humified, there should be little difference in it's action on leather diaphragms from that of Manufactured Gas. A somewhat similar condition confronted the company in 1930 following the initial distribution of practically 100% coke oven gas in place of the mixed coke oven and water gas previously distributed. The coke oven gas being drier than water gas would tend to have the same action on leather diaphragms as than from Natural Gas. To overcome this difficulty the coke oven gas was conditioned by humidification with water sprays and the introduction of oil fog into the gas stream. This oil fogging has been continued up to the present time. Examination of leather diaphragms of meters periodically tested indicate that they still retained the original dressing oil.

The Providence Gas Company has recognized the possible need for more extensive oil fogging with Natural Gas. In testimony at a hearing before the Federal Power Commission in May, 1950 on the application of Algonquin Gas Transmission Company for permit to distribute Natural Gas to certain New England companies, the Providence Gas Company at that time estimated the probable investment cost for connecting Natural Gas to its system. Included in that estimate was an allowance \$25,000 for oil foggers. This item was also included in the list of requirements for investment in the application filed with the Rhode Island Public Utility Administrator on November 13, 1951 for approval of its financing program.



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As gas companies in other parts of the country have changed from distribution of Manufactured Gas to Natural Gas, there have been reports of their experiences and as there were real possibilities of the introduction of Natural Gas to Providence there have been intensified discussions of the various problems that might be involved at numerous meetings of representatives of those companies. All of these meetings were attended by representatives of the Providence Gas Company including a meeting held in New York under auspices of the American Meter Company on the subject of Effect of Change-over to Natural Gas on Meter Diaphragms. Discussions were led by representatives of gas companies that had changed from Manufactured Gas to Natural Gas.

In comparatively recent years meter diaphragms have been made of a synthetic material as a substitute for leather. While diaphragms of these materials have been extensively tested they have not been used for a sufficient period on enough meters to prove whether they are preferable to leather diaphragms.

As there is no way of determining definitely in advance the effect of Natural Gas on gas meter diaphragms. To require additional work for testing or inspection of meters in advance of the coming of Natural Gas would have placed a financial burden on the company with no advantage to its customers. It would also have imposed on the company a severe man-power problem at a time when its experienced workers were required to meet special demands in connection with the change-over.

It is my opinion that with proper oil fogging and humidification of the Natural Gas, there will be no appreciable affect on meter dia-



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phragms from the substitution of Natural Gas for the Manufactured Gas formerly distributed which had a high percentage of coke oven gas, a relatively dry gas.

The Division of Public Utilities of the State of Rhode Island has definite regulations for the Pipe Lines for Gas, set forth in Chapter 122 of the General Laws of Rhode Island, 1938, with amendments, but there are no regulations governing Distribution of Gas. The regulations as set forth are broad and not specific, and the intent must be assumed. The intent should be specific and "spelled out" in additional legislation.

Mr. Kennelly has a complete draft of a set of regulations covering installation and operation of gas pipe lines, but lacks, the authority under statute to impose them, in his opinion.

He says he will ask the General Assembly to give him such authority at its next session.

As for the regulation of meters, he has no draft as yet, but is going to prepare a code. He says the gas company has admitted that the meter problem is apt to be troublesome, although they hope they will solve it through the fogging of natural gas to keep the meter bellows from drying out.

To date, Mr. Kennelly has not asked the General Assembly for such authority as stated.



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The Ordinance Committee of the City Council in reviewing the report of the Building Code Revision Committee should look into the feasibility of setting up specific rules and regulations governing the installation of gas appliances.

Respectfully submitted,

PJH, JR:tm

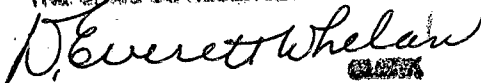

PETER J. HICKS, JR.
PUBLIC SERVICE ENGINEER

IN CITY COUNCIL

FEB 18 1954

RECORDED:

WHEREFORE IT IS ORDERED THAT
THE SAME BE RESOLVED.


CLERK

FILED

FEB 14 4 49 PM '54

CITY CLERK'S OFFICE
PROVIDENCE, R.I.