

BEFORE THE PUBLIC UTILITIES COMMISSION  
OF THE STATE OF COLORADO

IN RE RULES REGULATING GAS, ELEC- )  
TRIC AND WATER SERVICE OF ALL )  
PRIVATELY OWNED AND MUNICIPAL- )  
LY OWNED GAS, ELECTRIC AND WA- )  
TER PUBLIC UTILITIES OPERATING )  
WITHIN THE STATE OF COLORADO. )

Case No. 84

Submitted July 22, 1916

Decided October 5, 1916.

O R D E R

On the 7th day of July, 1916, at the hour of 10 o'clock a. m., after due notice to all gas, electric and water utilities operating in the State of Colorado, including municipally owned or operated utilities, the Commission held a hearing as to the reasonableness of a code prepared by the Commission prescribing rules regulating gas, electric and water service of all gas, electric and water public utilities, including municipally owned or operated utilities, operating within the State of Colorado. Prior to that date copies of the proposed code had been served upon all gas, electric and water utilities, both privately owned and municipally owned, operating within the State of Colorado, and at the hearing each public utility or municipality, through one or more representatives, was permitted to present evidence in criticism of the proposed code, and at the conclusion of the hearing, the Commission granted additional time to permit the filing with the Commission of additional written criticisms, objections and suggestions to the proposed code

of the Commission.

After a careful examination of the proposed code of the Commission, as well as the evidence submitted in the above cause, the Commission has decided upon a reasonable code of rules regulating gas, electric and water service of all privately owned and municipally owned or operated public utilities operating within the State of Colorado, in accordance with Section 31 of the Laws of the State of Colorado Pertaining to Public Utilities.

IT IS THEREFORE ORDERED, That the following code of reasonable rules and regulations pertaining to gas, electric and water service of all privately owned and municipally owned or operated public utilities operating within the State of Colorado, is hereby declared to be reasonable and shall be observed and followed by all gas, electric and water public utilities, including municipally owned or operated utilities operating within the State of Colorado.

IT IS FURTHER ORDERED, That this order shall take effect on the 1st day of January, 1917, and shall continue in force until suspended, modified or set aside by this Commission.

THE PUBLIC UTILITIES COMMISSION  
OF THE STATE OF COLORADO

S. A. Kennerly  
Chairman

Geo. T. Bradley

M. H. Smith  
Commissioners.

Dated at Denver, Colorado,  
this 5th day of October, 1916.

THE PUBLIC UTILITIES COMMISSION  
OF THE STATE OF COLORADO

---

RULES REGULATING GAS, ELECTRIC AND  
WATER SERVICE.

---

GENERAL RULES.

APPLYING TO ALL GAS, ELECTRIC AND WATER  
UTILITIES.

---

RULE 1.

APPLICATION OF RULES:-- (a) The following rules shall apply to any person, firm, corporation or municipality now or hereafter engaged as a public utility in the business of furnishing gas, electricity or water for domestic or commercial consumers within the State of Colorado.

(b) The adoption of these rules shall in no way preclude the Commission from altering or amending same in whole or in part or from requiring any other additional service, equipment, facility or standard, either upon complaint or upon its own motion, or upon the application of any utility. Furthermore, these rules shall not in any way relieve any utility from any of its duties under the laws of this State.

RULE 2.

DEFINITIONS:-- (a) The word "Utility" as used in these rules shall be construed to mean any person, firm or corporation engaged as a public utility, either municipally or privately owned, in the business of furnishing gas, electricity or water for domestic or commercial consumers within the State of Colorado.

(b) The word "Commission" as used in these rules shall be construed to mean The Public Utilities Commission of the State of Colorado.

(c) The word "Consumer" as used in these rules shall be construed to mean any person, firm or corporation supplied by any utility with gas, electricity or water.

### RULE 3.

#### OPERATING SCHEDULES AND INTERRUPTIONS OF SERVICE:--

(a) Each utility shall adopt an operating schedule, and shall report the same, or any changes therein, to this Commission, indicating in any case where service is not rendered continuously, the time at which service is commenced, and the time at which it is discontinued. Any changes in such operating schedules shall be made only with the approval of this Commission.

(b) Each utility shall keep a record of all interruptions of service upon its entire system or major divisions thereof, including a statement of the time, duration and cause of any such interruption. Each utility shall, except for stations operated without attendants, also keep a record of the time of starting up or shutting down the central station or sub-station generating, transforming or pumping equipment, and the period of operation of all regulators used for the maintenance of constant gas or water pressure, or constant voltage of electricity supplied. This record shall include the readings taken periodically of station meters and switchboard instruments, which readings shall be taken with such frequency as the utility or the Commission may from time to time require.

(c) The record of interruptions of service and a statement of the operating schedules of the utility shall be open at all times to the inspection of the duly authorized representatives of this Commission.

RULE 4.

INSPECTION OF PLANT AND EQUIPMENT:-- Each utility shall inspect its plant and distributing equipment and facilities in such manner and with such frequency as is in accord with good practice, in order that the same may be maintained in proper condition for use in rendering safe and adequate service.

RULE 5.

TESTING FACILITIES:-- (a) Each utility shall provide such laboratory, meter testing shop and other equipment and facilities as may be necessary to make the tests required of it by these rules or other orders of this Commission. The apparatus and equipment so provided shall be of a form acceptable to this Commission, and it shall at all times be available for the inspection and use, on the premises of the utility, of the authorized representatives of this Commission.

(b) Each utility shall make such tests as are prescribed under these rules with such frequency and in such manner and at such places as may be approved by this Commission.

RULE 6.

RECORDS OF TESTS AND OF METERS:-- A complete record of the tests made under these rules of the quality and condition of service shall be kept by each utility. The record so kept shall contain full information concerning each test, including the date, and the place where the test was made, the name of the employe conducting the test, the result of the test, and such other information as may be required by these rules, or as this Commission may from time to time direct, or as the utility making the test may deem desirable.

(b) Whenever any service meter is tested the original test record shall be preserved, including the information necessary for identifying the meter, the reason for making the test, the reading of the meter if removed from service, and the result of the test, together with all data taken at the time of the test in sufficiently complete form to permit the convenient checking of the methods employed and the calculations made.

(c) A record shall also be kept indicating for each meter owned or used by any utility, the date of purchase, manufacturer's serial number, record of the use, and tests to which it has been subjected, and its present location.

RULE 7.

ACCIDENTS: -- Each utility shall as soon as possible report to this Commission each accident happening in connection with the operation of its property, facilities or service, wherein any person shall have been killed or

seriously injured, or whereby any serious property damage shall have resulted; such first report shall later be supplemented by as full a statement as is possible of the cause and details of the accident, and the precautions, if any, which have been taken to prevent similar accidents. Each utility shall further give all reasonable assistance to the Commission in the investigation of the cause and suitable means for the prevention of any such accidents in the future.

RULE 8.

COMPLAINTS:-- Each utility shall make a full and prompt investigation of all complaints made to it by its consumers, either directly or through the Commission, and it shall keep a record of all written complaints received, which shall show the name and address of the complainant, the date and character of the complaint, and the adjustment or disposal made thereof. This record shall be open at all times to the inspection of the duly authorized representatives of this Commission.

RULE 9.

INFORMATION FOR CONSUMERS:-- (a) Each utility shall at any time, on request, give its consumers such information and assistance as is reasonably possible in order that consumers may secure safe and efficient service and may secure lamps and appliances properly adapted to the service furnished. Each utility shall inform each consumer of any such change made or proposed to be made in any condition as to its service as would affect the efficiency of the service or the operation of the appliances or equipment which may be in use by said consumer.

(b) Each utility supplying metered service shall adopt some means of informing its consumers as to the method of reading meters, either by printing on its bills a description of the method of reading meters or a notice to the effect that the method will be explained upon application. It is recommended that an exhibition meter be kept on display in each commercial office maintained by a utility.

RULE 10.

METER READINGS AND BILL FORMS:-- (a) Each service meter shall indicate clearly the cubic feet, kilowatt hours, gallons or other units of service for which charge is made to the consumer. In cases where the dial reading of a meter must be multiplied by a constant to obtain the units consumed, the proper constant to be applied shall be clearly marked on the face or dial of the meter.

(b) Each utility shall, upon written request of any consumer, cause the meter reader reading the meter installed upon the premises of such consumer, to leave upon such meter a card or slip showing the date and time such reading was taken, and either the total reading expressed in cubic feet, kilowatt hours, gallons or other unit of service recorded by the meter read, or showing the position of the hands upon the dial of such meter at the time the reading was taken.

(c) All bills rendered periodically to consumers for metered service furnished shall show, in addition to the net amount due, the dates on which the readings were taken, the meter readings at the beginning and end of the period

for which the bill is rendered, when requested by the consumer or deemed necessary by the utility, and all other essential facts upon which the bill is based.

RULE 11.

METER RENTALS, AND CONSUMER'S DEPOSITS:--

(a) No meter rental, as distinguished from a minimum charge for service, shall be charged by any utility for any service meter installed by it for measurements upon which bills are rendered; provided, however, that in cases where service meters are used as sub-meters to a main meter, a rental charge for such sub-meter may be established with the approval of this Commission. The utility shall keep such sub-meters in good operating condition, but will not be required to keep a record of the monthly readings of these meters.

(b) Any utility may require at any time from any consumer or prospective consumer, a cash deposit intended to guarantee payment of current bills. Such required deposit shall not exceed the amount of an estimated ninety days' bill of such consumer, or in the case of a consumer whose bills are payable in advance, it shall not exceed an estimated sixty days' bill for such consumer. Interest shall be paid by the utility upon such deposits at the rate of six per cent. per annum, payable upon the return of the deposit or annually upon request of the consumer, for the time such deposit was held by the utility and the consumer was served by the utility, unless such period be less than six months; provided, further, that the rate of interest on such cash

deposits shall be only four per cent. per annum if the utility keep such cash deposits in a separate and distinct trust fund and deposited as such in some bank or trust company, and not used by the utility in the conduct of its business. Interest payments may, at the option of the utility, be made either in cash, or by a credit to the consumer's account. In computing interest no consideration need be given to fractional parts of months or dollars.

(c) Each utility having on hand such deposits from consumers, or hereafter receiving such deposits from consumers, shall keep records to show: (1) the name of each consumer making a deposit; (2) the premises occupied by the consumer when making the deposit and each successive premises occupied while the deposit is retained by the utility; (3) the amount and date of making the deposit; and (4) a record of each transaction, such as the payment of interest, interest credited, etc., concerning such deposit.

(d) Each utility shall issue to every consumer from whom such deposit is received a certificate of deposit.

(e) Each utility shall provide ways and means whereby a depositor who makes application for the return of his deposit or any balance to which he is entitled, but is unable to procure the original certificate of deposit, may not upon reasonable proof be deprived of his deposit or balance.

RULE 12.

FILING OF RATE SCHEDULES, RULES AND REGULATIONS:--

(a) Copies of all schedules of rates for service, forms of contracts, charges for service connections and extensions of lines and of all rules and regulations covering the relations of consumer and utility, shall be filed by each utility in the office of this Commission. Complete schedules, contract forms, rules and regulations, etc., as filed with the Commission shall also be on file in the local office of the utility and shall be open to the inspection of the public.

(b) A copy of this order shall likewise be on file in the office of the utility and open to the inspection of the public.

(c) The attention of the public shall be called to these files of schedules, rules and regulations, and orders, by placing a suitable placard in the office of the utility.

(d) If the reasonableness of any charge, rule, regulation or practice of any utility with reference to service connections or extensions, or of any rule covering the relations between consumer and utility, is challenged, the Commission will, upon complaint and investigation, prescribe the proper charge, rule, regulation or practice which shall thereafter be followed.

DISCONTINUANCE OF SERVICE:-- No utility shall discontinue the service of any consumer for violation of any rule of such utility except upon written notice of at least forty-eight hours, advising the consumer in what particular such rule has been violated for which service will be discontinued. This rule may be waived where a by-pass is discovered on a consumer's service meter, or in the event of the discovery of dangerous leakage or short circuit on a consumer's premises, or in the case of a consumer utilizing the service in such a manner as to make it dangerous for occupants of the premises, thus making an immediate discontinuance of service to the premises imperative.

RULE 14.

METERS AND SERVICE CONNECTIONS:-- (a) All meters used in connection with metered service shall be furnished, installed and maintained at the expense of the utility. Any appliance furnished at the expense of the utility shall remain its property and may be removed by it at any time after the discontinuance of service.

(b) Service connections to the consumer's premises in the case of electric utilities, and to the consumer's property line in the case of gas and water utilities, shall be installed and maintained at the expense of the utility. This rule shall not apply when unusual conditions are encountered, or to very long service connections. When such special cases arise, the Commission will, if necessary, prescribe the proper charge.

(c) Any utility may require through its Rules and Regulations that prospective consumers advance the full cost of service connections, the amount so advanced to bear no interest, and to be applied on the consumer's bills until such time as the amount of service furnished under the prescribed schedule of rates shall equal the amount so deposited. Such deposits shall not cover the cost of meters, since these may be recovered by the utility upon the discontinuance of service by the consumer. Any utility may likewise require such deposits from consumers whose service connections are replaced for any cause. It is further provided that no consumer's deposit or advance payment for service shall be required from consumers making deposits for service connections until such time as the amount so deposited for service connections shall have been exhausted.

(d) No utility shall require from any consumer or prospective consumer a deposit intended to pay for all or any part of the cost of extension of mains or the installation of service connections, except under Rules and Regulations set down in the public schedules of the utility on file with this Commission.

---

Note: The term "service connection" refers to that portion of the distribution system which is installed for the use of individual consumers or small groups of consumers and does not refer to mains installed on the streets or public highways. The Commission has not attempted to lay down rules governing the extension of mains, but desires that each utility file its practice regarding such extensions.

RULE 15.

PRACTICE UNDER THESE RULES TO BE FILED:-- Each utility shall file with this Commission within four months after receipt of this order, a statement, typewritten, properly identified and dated, and on 8½x11 sheets, describing its practice under these rules as follows:

(a) Description of test methods employed and frequency of tests or observations for determining quality, voltage and pressure of gas, electric, and water service furnished.

(b) Description of meter testing equipment, including methods employed to ascertain and maintain accuracy of all testing equipment.

(c) Rules covering testing and adjustment of service meters when installed and periodic tests after installation.

Revisions in any portion of this statement after filing will necessitate the filing of an entire new statement, properly identified and dated, canceling the one on file.

RULE 16.

REPORTS TO COMMISSION:-- Each utility shall make special reports at such time and in such form as the Commission may from time to time require.

**SPECIAL RULES.**

**GAS.**

GAS.

RULE 17.

DEFINITION OF A CUBIC FOOT OF GAS:-- When the gas itself is to be tested under these rules, a cubic foot of gas shall be taken to be that amount of gas which occupies the volume of one cubic foot, saturated with water vapor, at sixty (60) degrees Fahrenheit, and under a pressure of thirty (30) inches of mercury. For the purpose of measurement of gas to a consumer, a cubic foot of gas shall be taken to be that amount of gas which occupies a volume of one cubic foot under the conditions existing in such consumer's meter as and where installed.

RULE 18.

HEATING VALUE OF GAS:-- Each utility furnishing manufactured gas shall supply gas which when tested within one mile of the manufacturing plant, shall give a monthly average total heating value of not less than 575 British thermal units per cubic foot and at no time shall the total heating value of the gas at such point fall below 525 British thermal units per cubic foot.

To obtain the monthly average total heating value of gas the results of all tests of the heating value made on any day during the calendar month shall be averaged, and the average of all such daily averages shall be taken as the monthly average. It is understood that gas of the heating value thus defined has a heating value per cubic foot as registered by the consumer's meter proportionately as much less than said 575 British thermal units per cubic foot as the total pressure of the gas in the consumer's meter is less than equivalent to thirty (30) inches of

mercury pressure.

RULE 19.

CALORIMETER EQUIPMENT:-- Each utility whose gas output exceeds twenty million cubic feet per annum, shall equip itself with a complete standard calorimeter outfit and all necessary accessories acceptable to this Commission, by which it shall determine the heating value of manufactured gas at least four days of each week. A complete record of these tests shall be kept for a period of not less than two years from the date of such tests.

RULE 20.

PURITY OF GAS:-- (a) All manufactured gas distributed in this state shall not contain more than a trace of hydrogen sulphide. The gas shall be considered as containing not more than a trace of hydrogen sulphide when a strip of white filter paper moistened with a solution containing five per cent. by weight of lead acetate is not distinctly darker than a second filter paper freshly moistened with the same solution after the first paper has been exposed to the gas for one minute in an apparatus of approved form through which the gas is flowing at the rate of approximately five cubic feet per hour, the gas not impinging directly from a jet upon the test paper.

(b) All manufactured gas distributed in this state shall contain in each one hundred cubic feet not more than thirty grains of total sulphur and not more than five grains of ammonia.

(c) Each utility supplying manufactured gas shall daily test the gas leaving its holders for the presence of hydrogen sulphide in the manner above specified. Each utility selling more than 75,000,000 cubic feet of manufactured gas per year shall provide and maintain such apparatus and facilities as are necessary for the determination of total sulphur and ammonia in gas, and each such utility shall regularly determine the amount of total sulphur and ammonia in the gas distributed by it; provided that any such utility supplying only water gas or oil gas or a mixture of these, shall not be required to provide apparatus or make determination of the amount of ammonia in gas.

RULE 21.

PRESSURE OF GAS:-- (a) Subject to the approval of this Commission each gas utility may divide its distributing system into as many districts as it shall consider desirable, and it shall fix for each such district or for its distributing system as a whole, the normal pressure of gas which it proposes to maintain.

Except by special permission from this Commission for the maintenance of a higher service pressure, gas shall not be furnished at less than equivalent to two inches, nor more than equivalent to eight inches of water pressure as measured at the outlet of the service connection to any consumer. The maximum pressure on any day at any consumer's service shall never exceed twice the minimum pressure at that outlet on that day.

(b) Each utility furnishing gas service in cities of 2,500 inhabitants or over shall maintain a graphic recording pressure gauge at its plant, downtown office, or at some central point in the distributing system, or each sub-division thereof, where continuous records shall be made of the service pressure at that point.

Utilities operating in cities of 5,000 or more inhabitants shall equip themselves with one or more graphic recording pressure gauges in addition to the foregoing, and shall make frequent records, each covering intervals of at least 24 hours duration, of the gas service pressure at various points on the system. All records or charts made by these meters shall be identified, dated and kept on file available for inspection for a period of at least two years.

#### RULE 22.

GAS METER ACCURACY AND TESTING:-- (a) Every gas service meter whether new, repaired or removed from service for any cause, shall be in good order and shall be adjusted to be correct to within one per cent. when passing gas at six cubic feet per hour per rated light capacity before being installed for the use of a consumer.

(b) No gas service meter hereafter installed shall be allowed to remain in service more than five years from the time when last tested without being re-tested and if necessary re-adjusted to be correct to within one per cent.

(c) During each period of twelve months after these rules take effect and until all meters now in service shall have been tested, each gas utility shall remove not less than twenty per cent. of all meters now in service, those longest in service to be removed first; such meters shall not again be placed in service until tested and made to comply with all provisions of this rule.

RULE 23.

METER TESTING ON REQUEST:-- Each gas utility furnishing metered gas service shall at any time when requested by a consumer make a test of the accuracy of any gas service meter free of charge; provided, first, that such meter has not been tested within the twelve months period prior to such request, and second, that the consumer will agree to accept the result of such test made by the utility as the basis for settling the difference claimed. No charge shall be made to the consumer for any such test except as may be allowed by the Commission in special cases. A written report giving the result of every such test shall be made to the consumer who requested it, the original record being kept on file at the office of the utility for a period of at least two years.

RULE 24.

TESTS BY COMMISSION:-- (a) Any gas service meter will be tested by an employe of the Commission upon written application by the consumer. The application for such test shall be accompanied by a remittance

of the amount fixed below as the fee for such test. If the meter is found to be fast beyond the limits prescribed in Rule 25, this fee shall be paid to the consumer by the utility; otherwise, these expenses shall be borne by the consumer requesting the test. The Commission's fees for gas meter tests are:

Not exceeding 10 lights capacity, each...\$2.00

Exceeding 10 lights capacity but not  
exceeding 45 lights capacity, each.... 4.00

Exceeding 45 lights capacity, each..... 8.00

(b) Upon written application to the Commission by any gas utility the Commission will make a test on any of the utility's service meters upon payment of the scheduled fee.

#### RULE 25.

ADJUSTMENT OF BILLS FOR METER ERROR:-- (a) If on test of any gas service meter, on request of the consumer, either by the utility or the Commission, it be found more than two per cent. fast, the utility shall refund to the consumer such percentage of the amount of the bills of the consumer for the period of six months just previous to the removal of such meter from service, or for the time the meter was in service, not exceeding six months, as the meter shall have been shown to be in error by such test.

(b) If on test of any gas service meter, on request of a consumer, either by the utility or the Commission, it be found to be more than two per cent. slow,

the utility may collect from the consumer the amount estimated to be due for gas not charged for in bills rendered for not to exceed the six months period prior to such test.

(c) If a gas service meter is found not to register for any period the utility shall estimate a charge for the gas used but not metered by averaging the amounts used over similar periods preceding or subsequent thereto, or over corresponding periods in previous years.

#### RULE 26.

METER TESTING FACILITIES:-- Each utility having more than 200 gas meters in service shall maintain one or more suitable gas meter provers of standard design, and shall keep the same in proper adjustment so as to register the condition of meters tested within one-half of one percent. Each meter prover must be accompanied by a certificate of calibration indicating that it has been tested with a standard which has been certified by the National Bureau of Standards or some testing laboratory of recognized standing. Meter provers must be located in a large, comfortable working space, free from excessive temperature variations, equipped with all necessary facilities and accessories, and at all reasonable hours accessible for inspection and use by the duly authorized representatives of this Commission.

SPECIAL RULES.

ELECTRICITY.

ELECTRICITY

RULE 27.

ACCEPTED GOOD PRACTICE:-- The generating and distributing system including generating equipment, transmission lines, sub-stations, overhead system, poles, lines, transformers, underground system, manholes, conduits, etc., street lighting systems, service wires and attachments, meters and instruments, shall be constructed, installed and maintained in accordance with accepted good practice.

RULE 28.

POLE IDENTIFICATION:-- (a) In the case of two or more utilities jointly owning or using a pole or pole line structure, each of these utilities shall mark each such pole or structure with the initials of its name, abbreviation of its name, corporate symbol, or other distinguishing mark by which the ownership of such structure may be readily and definitely determined.

(b) Each utility shall in the future mark each such pole, post or other structure used for supporting electrical conductors with "dating nails" or other approved devices which will indicate the year in which such structures were installed. It is suggested that a different type of dating nail be used for new poles or structures and for poles re-used. All poles or structures known to have been installed or replaced during the preceding year shall likewise be so marked.

(c) The requirements herein shall apply to all existing and future erected structures and to all changes in ownership.

RULE 29.

POLE INSPECTION:-- Each pole, post, tower or other structure used for the support or attachment of electrical conductors, guys or lamps, must be inspected by the utility owning or using it with sufficient frequency to determine the necessity for replacement or repair.

RULE 30.

GROUNDING OF LOW-POTENTIAL CIRCUITS:-- The rules currently in force contained in the National Electric Safety Code regarding grounding of low-potential circuits shall be followed for all new construction. Each utility shall adopt a plan whereby existing circuits will be grounded in conformity with this rule, and submit the same to this Commission for approval not later than June 1, 1917.

RULE 31.

STANDARD VOLTAGE AND PERMISSIBLE VOLTAGE VARIATION:--(a) Each utility shall adopt a standard average voltage or standard average voltages, as may be required by its distribution system, for its entire constant-voltage service, or for each of the several districts into which the system may be divided, and shall file with this Commission a statement as to the standard average voltage or average voltages adopted.

Every reasonable effort shall be made by the use of proper equipment and operation to maintain such voltage practically constant at all times. The suitability and adequacy of these service voltages may be determined at any time by this Commission. The voltage maintained at the utility's main service terminals\* as installed for individual consumers or groups of consumers shall be reasonably constant as follows:

(1) For service rendered under a lighting contract or primarily for lighting purposes the voltage between 6:00 o'clock p. m. and 11:00 o'clock p. m., shall be within five per cent. plus or minus of the standard adopted, and the total variation of voltage from minimum to maximum during the hours above specified shall not exceed seven per cent. of the average voltage in cities and other incorporated places having a population in excess of 2,500, nor nine per cent. of the average voltage in all other places.

(2) For service rendered under a power contract or primarily for power purposes the voltage variation shall not exceed ten per cent. above or ten per cent. below the standard average voltage at any time when the service is furnished.

---

\*The term "service terminal" refers to the point at which the utility's service connections terminate, at which point connection is made with the consumer's wiring, and beyond which the utility has no responsibility.

(3) A greater variation of voltage than that specified above may be allowed when service is furnished directly from a transmission line or in a limited or extended area where consumers are widely scattered and the business done does not justify close voltage regulation. In such cases the best voltage regulation should be provided that is practicable under the circumstances. This clause refers particularly to individual consumers or small groups of consumers whose service from a transmission line is incidental, and does not refer to the voltage regulation in communities, cities or towns for which the transmission line was primarily built.

(b) Variations in voltage in excess of those specified caused (1) by the operation of power apparatus on the consumer's premises, which necessarily requires large starting currents, (2) by the action of the elements, (3) by infrequent and unavoidable fluctuations of short duration due to necessary station or line operations, shall not be considered a violation of this rule.

(c) Utilities supplying power to one or more other electric utilities may make application to the Commission for a specific ruling applicable to each particular case.

#### RULE 32.

VOLTAGE SURVEYS AND RECORDS:-- Each utility shall provide itself with one or more portable indicating volt-meters and each utility serving more than 200 consumers shall have one or more recording volt-meters of the curve drawing type suitable for the service voltages

furnished. Each utility shall make a sufficient number of voltage surveys to indicate the character of service furnished from each center of distribution and to satisfy this Commission, upon request, of its compliance with the above voltage requirements. Utilities having curve drawing volt-meters shall keep at least one of these instruments in continuous service at the plant, office or some consumer's premises. All volt-meter records shall be available for inspection by the authorized representatives of this Commission for a period of at least two years from the date of such records.

RULE 33.

LOCATION OF METERS:-- (a) It is recommended that all meters hereafter installed on consumers' premises should be located in the cellar or on the first floor or as nearly as possible at the point of entrance of service to the premises, in a clean, dry, safe place not subject to great variations in temperature, and on a support free from vibration. When it is necessary to install meters out of doors they should be suitably protected from the elements and other sources of damage.

(b) Meters should not be placed in coal or wood bins or on the partitions forming such bins, nor on any unstable partitions or supports. Unless unavoidable, meters should not be installed in attics, sitting rooms, bath rooms, bed rooms, restaurant kitchens, over doors, windows, or in any location where the visits of the meter reader or tester will cause annoyance to or inconvenience the consumers.

(c) Meter locations should be such that they are easily accessible for reading, testing and making necessary adjustments and repairs. When a number of meters are placed on the same meter board the distance between centers should not be less than fifteen inches, and each meter loop should be so tagged or marked as to indicate the circuit metered. Meters should preferably be not less than four feet nor more than seven feet above the floor or a suitable platform.

RULE 34.

METER TESTING FACILITIES AND EQUIPMENT:-- (a)

Each utility furnishing metered electric service shall, unless specifically excused by the Commission, provide such meter laboratory, standard meters, instruments, and other equipment and facilities as may be necessary to make the tests required by these rules. Such equipment and facilities shall be acceptable to the Commission and shall be available at all reasonable times for the inspection of its authorized representatives.

(b) (1) Each utility furnishing metered electric service shall provide such portable indicating electrical testing instruments or watt-hour meters, switch-board instruments, recording volt-meters, and other electrical instruments in use, as may be deemed necessary and satisfactory by the Commission.

(2) For testing the accuracy of portable watt-hour meters, commonly called "rotating standards," and other portable instruments used for testing service meters,

each utility not specifically excused by the Commission, as provided for in Section (a) of this rule, shall provide as reference or check standards suitable indicating electrical instruments, watt-meters, watt-hour meters, or any or all of them hereafter called "reference standards." Such reference standards may be of the service type of watt-hour meters, but if so, such watt-hour meters shall be permanently mounted in the meter laboratory of the utility and be used for no other purpose than for checking rotating standards.

Reference standards of all kinds shall be submitted at least once each year to the Standardizing Laboratory of the University of Colorado, or to some laboratory of recognized standing, for the purpose of test and adjustment. Utilities maintaining standardizing laboratories will be permitted to make their own tests and certifications of reference standards, provided the instruments and methods in use are acceptable to the Commission.

(3) All portable watt-hour meters (rotating standards) shall be compared with the reference standards at least once a week for commutator types, and once in two weeks for induction types, during the time such portable standards are being regularly used. Unless accompanied by a calibration card, if such check shows any portable watt-hour meter to be in error more than one per cent. plus or minus at any load at which the standard will be used, the meter shall be tested, adjusted and certified in the Standardizing Laboratory of the University of Colorado or at some standardizing laboratory of recognized standing. Each portable watt-hour meter (rotating standard) shall at all times be accompanied by a certificate

or calibration card signed by the proper authority, giving the date when it was last certified and adjusted. Records of certifications and calibrations shall be kept on file in the office of the utility.

(4) All portable indicating electrical testing instruments, such as voltmeters, ammeters and wattmeters, when in regular use for testing purposes, shall be checked against suitable reference standards at least once a week when continually in use, and if found appreciably in error at zero, or more than one per cent. of full scale value at commonly used scale deflections, shall, unless accompanied by a calibration card, be adjusted and certified in some laboratory of recognized standing.

#### RULE 35.

ACCURACY REQUIREMENTS FOR SERVICE WATT-HOUR METERS:-- (a) No service watt-hour meter that has an incorrect register constant, test constant, gear ratio or dial train, or that registers upon no load ("creeps"), shall be placed in service or allowed to remain in service without proper adjustment and correction.

(b) No service watt-hour meter that has an error in registration of more than plus two or minus three per cent. at light load, or plus or minus two per cent. at heavy load, shall be placed in service. Whenever on installation, periodic or any other tests, a meter is found to exceed these limits, it must be adjusted. A meter creeps when, with all load wires disconnected, the moving element makes one complete revolution in ten minutes or less.

(c) Light load shall be construed to mean approximately five to ten per cent. of the rated capacity of the meter. Heavy load shall be construed to mean not less than sixty per cent. nor more than one hundred per cent. of the rated capacity of the meter.

(d) Meters installed with instrument transformers or shunts shall be tested jointly with such transformers or shunts; otherwise the ratio of transformation of the transformers and the resistance of the shunts must have been previously determined within five years and be on file at the office of the utility for use in calculating the results of tests made. All such calibration tests must have been made by a laboratory of recognized standing or by the utility using apparatus and methods approved by this Commission.

#### RULE 36.

INSTALLATION TESTS:-- All service watt-hour meters shall be tested and adjusted to register accurately to within the limits specified in Rule 35 and to otherwise conform with the requirements of that rule, either before installation or within sixty days after installation. Each commutator meter and direct-current meter shall be tested and adjusted within sixty days after installation. Whenever possible all meters should be tested after being installed for service, at which time they should be checked for correct connection, suitable location and proper mechanical condition.

RULE 37.

PERIODIC TESTS:-- (a) All types of watt-hour meters installed upon consumers' premises shall be periodically tested according to the following schedule:

SCHEDULE FOR PERIODIC TESTING OF WATT- HOUR METERS

	: Rated capacity of meter : in amperes or kilovolt : amperes.	: To be tested : at least : once in every
Direct-current Meters.....	: Exceeding 500 amperes.....	: 12 months
	: 500 amperes to 15 amperes:	: 18 months
	: 15 amperes and less.....	: 24 months
Alternating-current Meters:	:	:
1. Single Phase.....	: Exceeding 25 amperes.....	: 24 months
	: 25 amperes and less.....	: 36 months
2. Polyphase.....	: Exceeding 50 kilovolt	:
	: amperes.....	: 12 months
	: 50 kilovolt amperes and	:
	: less.....	: 24 months
	:	:
	:	:

(b) All watt hour meters in service on and after January 1st, 1917, for which there is no record on file at the utility's office of tests made within the period of time specified for that class and rating of meter shall be tested as soon as possible. In no case shall the time subsequent to such test exceed the period of test for meters of that class and rating as specified in this rule.

RULE 38.

REQUEST TESTS:-- Each utility furnishing metered electric service shall make a test of the accuracy of any electric service meter free of charge upon request of a consumer; provided that the meter has not been tested within

the twelve months period prior to such request, and provided that the consumer will accept the results of such test as a basis for the settlement of the difference claimed. A written report giving the result of such test shall be made to the consumer requesting same, the original record being kept on file at the office of the utility for a period of at least two years.

RULE 39.

TESTS BY COMMISSION:-- (a) Any service watt-hour meter will be tested by an employe of the Commission upon written application by the consumer. For such test a fee shall be forwarded to the Commission by the party making application for the test, which fee shall be refunded to the consumer by the utility if the meter be found fast beyond the limits prescribed in Rule 40. The schedule of fees for Commission tests of watt-hour meters is as follows:

- (1) For continuous current and single phase meters operating on 600 volts or less, up to and including 25 amperes rated capacity of the meter element, each.....\$ 2.00
- (2) For each additional 50 amperes or fraction thereof..... 0.50
- (3) For single phase meters above 600 volts and for polyphase meters with or without instrument transformers up to and including 25 kilowatts rated capacity..... 3.00
- (4) For each additional 25 kilowatts rated capacity or fraction thereof.... 3.00

(b) Upon written application to the Commission by any electric utility, the Commission will make a test on any of the utility's service meters upon payment of the scheduled fee.

RULE 40.

ADJUSTMENT OF BILLS FOR METER ERRORS:-- (a) If on test of any service watt-hour meter, made upon the request of the consumer, by either the utility or the Commission, it is found to be more than three per cent. fast at any load, additional tests shall be made to determine the average error of the meter.

(b) Average Error: The average error of a meter in tests made by the Commission or the utility at the request of the consumer shall be defined as one-half the algebraic sum of (1) the error at light load, and (2) the error at heavy load.

(c) When a meter is found to have a positive average error; that is, is fast in excess of three per cent. in tests made at the request of the consumer by either the Commission or the utility, the utility shall refund to the consumer an amount equal to the excess charged for the kilowatt-hours incorrectly metered for a period equal to one-half of the time elapsed since the last previous test, but not to exceed six months.

(d) When a meter is found to have a negative average error -- that is, is slow -- in excess of three per cent. in tests made at the request of the consumer by either the Commission or the utility, the utility may make a charge to the consumer for the kilowatt hours incorrectly metered for a period equal to one-half of the time elapsed since the last previous test, but not to exceed six months.

(e) If a meter is found not to register for any period the utility shall estimate a charge for the kilowatt-hours used by averaging the amounts registered over similar periods preceding or subsequent thereto, or over corresponding periods in previous years.

RULE 41.

INSPECTION OF INCANDESCENT LAMPS:-- Each utility supplying electricity for incandescent lighting shall inspect in a general way the incandescent lamps of each consumer, to whom free lamp renewals are supplied, at least once every two years, and render its consumers reasonable assistance in securing incandescent lamps and other appliances best adapted to the service furnished. It should also see that lamps furnished consumers without charge or at prices less than the open market prices, shall be of such efficiency in watts per candle when used on the utility's circuits of standard voltage as defined in Rule 31, that the cost of light per candle power hour to consumers will not exceed the cost per candle power hour when incandescent lamps of like type are bought in the open market.

RULE 42.

STATION INSTRUMENTS AND WATT-HOUR METERS:-- Each utility shall install such curve drawing wattmeters, indicating instruments or watt-hour meters as may be necessary to obtain a daily record of the load, and a monthly record of the output of its plants. Each utility purchasing electrical energy shall install such instruments or watt-hour meters as may be necessary to furnish full information as to the monthly purchases.

SPECIAL RULES.

WATER.

WATER.

RULE 43.

PURITY OF WATER SUPPLY:-- (a) All water furnished by any utility for human consumption and general household purposes should be free from disease producing organisms, injurious chemical or physical substances, and agreeable to the sight and smell.

(b) Water which rarely shows the presence of the "B. Coli Group" and which has a reasonably low "Bacterial Count" under the usual standard test methods will ordinarily be considered safe from the standpoint of disease producing organisms.

RULE 44.

CHEMICAL AND BACTERIOLOGICAL ANALYSES:-- (a) Each utility furnishing water for human consumption or household purposes shall take a sample monthly, or as much oftener as this Commission or the State Board of Health may require, from the source of supply or any point in the service designated by this Commission or the State Board of Health, in accordance with the rules for sampling water as prescribed by the State Board of Health, and shall forward same to the State Chemist at Boulder, Colorado for test and analysis. Such test and analysis shall be made free of charge. The result of such test and analysis shall be recorded in triplicate, one copy to be furnished to this Commission, one to the State Board of Health and one to the utility.

(b) Each utility supplying water to a town or city of five thousand (5,000) inhabitants or more, according to the last census of the United States, shall provide and use suitable testing equipment for making proper tests for bacillus coli and other bacteria, and tests for turbidity and quantity of matter in suspension, whereby the water furnished by it to consumers shall be tested at least once a week and at such other times and whenever required by this Commission. The results of such tests shall be recorded in triplicate, one copy to be sent to the State Board of Health, one copy to be sent to this Commission and one copy to be retained by the utility.

The Commission reserves the right to require, under its supervision, an extended bacteriological as well as physical and chemical examination, when deemed advisable for any particular water furnished.

(c) The results of all tests made, either by the State Chemist or by the utility, shall be kept on file and available for public inspection for a period of at least two years. These records must indicate when, where and by whom each test was made. The standard methods of water analysis recommended by The American Public Health Association for 1912, except as hereinbefore provided, should be followed as regards chemical, physical and bacteriological examinations and collection of water, and any departure therefrom should be specifically stated.

(d) Whenever tests made by the State Chemist, by the utility, or for any other purpose disclose the presence of bacillus coli or a high bacterial count, the utility shall employ all reasonable means to make its

water supply safe for human and domestic purposes.

RULE 45.

OPERATION OF "DEAD ENDS":-- "Dead Ends" in the distributing mains should be avoided as far as possible. Where such "dead ends" exist, they should be flushed at least once each week. To insure compliance with this requirement, it is suggested that where feasible all "dead ends" be equipped with hydrants.

RULE 46.

ADEQUATE PRESSURE REQUIRED:-- Every effort shall be made to maintain a steady pressure which will not at any time fall below the fixed minimum for domestic service. In addition to furnishing commercial service, each utility furnishing fire hydrant service must be able at any time within reasonable notice to supply added fire service in accordance with the best standard practice covering service to local fire fighting equipment and facilities.

When the foregoing pressure requirements are outlined in a reasonable manner by the ordinances under which the utility operates, they should be complied with as set forth therein.

RULE 47.

PRESSURE SURVEYS:-- Each utility furnishing water service in cities of 1,000 inhabitants or more shall maintain a graphic recording pressure gauge at its plant, down-town office, or at some central point in the distributing system or each subdivision thereof, where continuous records shall be made of the pressure in the mains

at that point.

Utilities operating in cities of five thousand or more inhabitants shall equip themselves with one or more graphic recording pressure gauges in addition to the foregoing and shall make frequent records, each covering intervals of at least 24 hours duration, of the water pressure at various points on the system. All records or charts made by these meters shall be identified, dated and kept on file, available for inspection for a period of at least two years.

RULE 48.

METERS:-- No service water meter shall be allowed in service which has an incorrect gear ratio or dial train, or is in any way mechanically defective, or shows an error in measurement in excess of three per cent., plus or minus, when registering water at stream flow, equivalent to approximately one-tenth, one-half and full normal rating under average service pressure. When adjustment is necessary, such adjustment should be made as accurately as practicable for average rate of flow under actual conditions of installation. Tests for accuracy shall be made with suitable testing devices in accordance with the best modern water meter practice.

RULE 49.

PERIODIC TESTS:-- Unless otherwise ordered by the Commission each service water meter installed shall be periodically removed, inspected and tested in accordance with the following schedule, or as much oftener as the results obtained may warrant to insure compliance with the provisions of Rule 48.

Five-eighths inch meters, ten years, or for each 100,000 cubic feet of registration.

Three-fourths inch meters, eight years, or for each 150,000 cubic feet of registration.

One inch meters six years, or for each 300,000 cubic feet of registration.

All meters above one inch, every four years.

#### RULE 50.

REQUEST TESTS:-- Each Utility furnishing metered water service shall make a test of the accuracy of any service water meter free of charge upon the request of a consumer; provided that the meter has not been tested within the twelve months period prior to such request, and provided that the consumer will agree to accept the result of such test as a basis for the adjustment of the difference claimed. A written report giving the result of such request test shall be made to the consumer requesting same, the original record being kept on file at the office of the utility for a period of at least two years.

#### RULE 51.

TESTS BY COMMISSION:-- (a) Any service water meter will be tested by an employe of the Commission upon written application of the consumer for such test. For such test a fee shall be forwarded to the Commission by the consumer when making application, which fee shall be refunded to the consumer by the utility if the meter be found fast beyond the limits prescribed in Rule 52. The schedule of fees for Commission tests of water service meters is as follows:

For each meter not exceeding 1 inch  
capacity..... \$2.50

For each meter exceeding 1 inch but  
not exceeding 2 inches capacity... 4.00

For meters exceeding 2 inches capacity 8.00

(b) Upon written application to the Commission by any water utility, the Commission will make a test on any of the utility's service meters upon payment of the scheduled fee.

RULE 52.

ADJUSTMENT OF BILLS FOR METER ERRORS:-- (a) If on test of any service water meter, made upon the request of the consumer, by either the utility or the Commission, it is found to be more than four per cent. fast, additional tests shall be made to determine the average error of the meter.

(b) Average Error: The average error of a water meter in tests made by the Commission or the utility at the request of the consumer shall be defined as one-third of the algebraic sum of the errors when tested in accordance with Rule 47.

(c) When a meter is found to have a positive average error -- that is, is fast -- in excess of four per cent. on tests made at the request of the consumer by either the Commission or the utility, the utility shall refund to the consumer an amount equal to the excess charged for the water incorrectly metered for a period equal to one-half of the time elapsed since the last previous test, provided that this period does not exceed one year.

(d) When a water meter is found to have a negative average error -- that is, is slow -- in excess of four per cent. in tests made at the request of the consumer by either the Commission or the utility, the utility may make a charge to the consumer for the water incorrectly metered for a period equal to one-half of the time elapsed since the last previous test, provided that this period does not exceed one year.

(e) If a meter is found not to register for any period the utility shall estimate a charge for the water used by averaging the amounts registered over similar periods preceding or subsequent thereto, or over corresponding periods in previous years.

#### RULE 53.

METER TESTING EQUIPMENT:-- Each utility furnishing metered water service in cities of 1,500 or more inhabitants shall maintain suitable water meter testers and keep same in proper adjustment so as to accurately register the condition of the meters at all times.

Each water meter tester must be accompanied by a certificate of calibration indicating that the volumes or weighing devices used have been referred to proper standards, which standards have been certified by the National Bureau of Standards, or some testing laboratory or other authority of recognized standing.

Meter testers must be located in a large comfortable working space, easily accessible, and equipped with all necessary facilities and accessories. They must be available for inspection and use at all reasonable hours by the authorized representatives of this Commission.

---

Case 84

BEFORE THE PUBLIC UTILITIES COMMISSION  
OF THE STATE OF COLORADO

april 16 1935

1000  
H.B.D.  
A.R.  
J.B.

FIRST REVISED ISSUE OF RULES REGULATING SERVICE OF GAS, ELECTRIC  
AND WATER UTILITIES.

In the Matter of the First Revised Rules Regulating the  
Service of Gas, Electric and Water Utilities.

On October 5, 1916, this Commission entered an order adopting  
rules regulating the Service of Gas, Electric and Water Service of all  
privately owned and municipally owned Gas, Electric and Water Public  
Utilities operating within the State of Colorado.

Since the adoption of these rules some revisions have been duly  
made in the rules, and decisions of the courts have made certain limitations  
in the jurisdiction of the Commission over said public utilities which now  
require modification of the rules. Also some of the rules have been re-  
vised and some additions have been made to the rules to agree with present  
day knowledge and practice and to include matters that the experience of  
the Commission has found necessary for the proper protection of all the  
interests concerned.

For convenience the Commission will designate this issue of the  
rules regulating the service of Gas, Electric and Water Utilities as the  
First Revised Issue.

O R D E R

IT IS THEREFORE ORDERED, That the revised rules regulating the  
service of Gas, Electric and Water Utilities under the jurisdiction of this  
Commission in the State of Colorado, hereto attached and made a part hereof,  
be, and the same are, hereby approved and adopted to be hereafter designated  
as the First Revised Issue.

IT IS FURTHER ORDERED, That the said First Revised Issue of the  
rules regulating the Service of Gas, Electric and Water Utilities shall  
become effective June 1, 1935.

THE PUBLIC UTILITIES COMMISSION  
OF THE STATE OF COLORADO

Edward J. O'Connell  
Walter J. O'Connell  
William E. O'Connell  
Commissioners.

( S E A L )

Dated at Denver, Colorado,  
this 18th day of April, 1935.