GENERAL RULES AND REGULATIONS
FOR ELECTRIC SERVICE
STANDARDS

SECTION 10

10.01 ELECTRIC SYSTEM OPERATION AND MAINTENANCE: Company will construct, operate and maintain its electric system in such manner as to furnish good, safe, adequate, and continuous electric service in accordance with the provisions of applicable codes. [199--20.5(1)]

10.02 INTERRUPTION OF SERVICE: Company will exercise reasonable diligence and care to furnish and deliver a continuous and sufficient supply of electric energy to Customer and attempt to avoid any shortage caused by interruption in delivery thereof. [199--20.7(11)]

10.02A Company, whenever it shall find it necessary for the purpose of making repairs or improvements to its system, shall have the right to temporarily suspend the delivery of electric service. In all cases of interruption or suspension of service, Company will make reasonable effort to restore service within the shortest time possible, consistent with good safety practices.

10.03 STANDARD FREQUENCY: The standard frequency for alternating current distribution systems shall be 60 cycles per second. Such frequencies shall be maintained within the limits prescribed by the Rules and Regulations of the Iowa Utilities Board. [199--20.7(1)]

10.04 VOLTAGE STANDARDS: Company's standard nominal voltages for its secondary voltage distribution system are found in Paragraph 4.03 of these General Rules and Regulations.

10.05 PERMISSIBLE SECONDARY VOLTAGE VARIATION: Company will make every reasonable effort to maintain the aforesaid voltages, as measured at Company's service terminals, so that for 120-600 volt nominal service variations of no more than 5% above or below the standard voltage will occur. The foregoing limits are based on constant load-consuming devices or gradual load changes and not on fluctuating loads. Variations in voltage in excess of those specified herein, caused by the operation of apparatus on Customer's premises which necessarily require a large inrush of current, will not be considered as a violation of this section. [199--20.7(5)]

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10.06 PERMISSIBLE PRIMARY VOLTAGE VARIATION: Company will make every reasonable effort to maintain the aforesaid voltages for service rendered principally for industrial or power purposes so that service variance of no more than 5% above or 2.5% below the standard nominal voltage will occur. The permissible variance for Qualifying Facilities will be determined in accordance with the rules and regulations of the Iowa Utilities Board and Section 16 hereof.

10.06A For service rendered to public utilities and others for resale, the nominal voltage shall be mutually agreed upon by the parties concerned. The allowable variation shall not exceed 7.5% above or 7.5% below the agreed-upon nominal voltage without the express approval of the Board.

10.07 TESTING EQUIPMENT: Company will provide such testing apparatus and equipment as may be necessary to comply with the rules and regulations of the Board and the provisions hereof.

10.07A Company will have available rotating standard watthour meters (rotating standards) and/or non-rotating solid state RMS responding watthour standards (solid state standards); as working standards, indicating electrical instruments, and portable recording voltmeters all of types and capacities suitable for testing service meters and making electrical tests on its system.

10.07B Company will have available suitable electric measuring instruments, rotating standards and/or solid state standards to be used as reference standards (secondary standards) for testing and maintaining the accuracy of its working standards and instruments. Company will have such equipment checked periodically as described by the Company, Electric Meter Shop Rules for the Inspection And Testing Program or by the rules of the Iowa Utilities Board by comparison with the standards at a laboratory acceptable to the Board. [199--20.7(8)]

10.08 METER TEST PROCEDURES AND ACCURACIES:
(The following provisions apply to all metering utilized by the Company to measure Customer electrical usage, including electronic solid state technologies associated with automated meter reading, or other applications where such equipment is deemed appropriate by the Company. Such metering shall be evaluated and beta tested before widespread use by the Company).

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10.08 METER TEST PROCEDURES AND ACCURACIES (continued):

10.08A Alternating current watthour meters.

10.08A(1) Tests Loads. For self-contained meters, heavy load will be approximately 100% of test current and light load approximately 10% of test current. For meters used with current transformers, heavy load will be approximately 100% of either meter test current or the secondary current rating of the current transformers; light load will be approximately 10% of the selected heavy-load current.

10.08A(2) Adjustment Limits. When a test of a watthour meter indicates that the error in registration exceeds 1% at either light load or heavy load at unity power factor, or exceeds 2% at heavy load at approximately 0.5 power factor lag, the percentage registration of the meter will be adjusted to within these limits of error, as closely as practicable to the condition of zero error.

10.08A(3) Acceptable Performance. Although compliance with paragraph 10.08A(2) is mandatory, the performance of a watthour meter is considered to be acceptable for In-Service Tests when the percentage registration is not more than 102% or less than 98% calculated in accordance with the following method:

10.08A(3)a Average percentage registration is the weighted average of the percentage registration at light load (LL) and at heavy load (HL), giving the heavy load registration a weight of 4. By this method:

10.08A(3)b Weighted average percentage registration =

$$\frac{LL + 4HL}{5}$$

[199--20.6]

10.08B Demand Meters, Demand Registers.

10.08B(1) Acceptable Performance. The performance of a mechanical demand meter or register will be acceptable when the error in registration does not exceed 4% in terms of full-scale value when tested.

10.08B(2) Adjustment Limits. When a test of a demand meter or register indicates that the error in registration exceeds 4% in terms of full-scale value, the demand meter or register will be adjusted to within 2% of full-scale value

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10.08 METER TEST PROCEDURES AND ACCURACIES (continued)

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10.08B(3) Shop Tests Of Block-Interval Pulse-Operated Demand Meters. Demand meters will be operated at a known number of pulses per demand interval, from 30% to 60% of full-scale value. The demand indicator will be set at zero and the tests started at the beginning of a time interval. The demand will be checked by reference to the number of pulses transmitted or against the kilowatthour registration during the test. The demand interval will be determined and the billing period reset checked for proper operation.

10.08B(4) In-Service Tests of Block-Interval Pulse-Operated Demand Meters. The tests will include a check of the electrical and mechanical operation of the demand meter and a check to determine that the demand meter resets properly. The demand interval should be determined using any load point.

10.08B(4)a A demand meter may be considered to be operating properly when a kilowatthour check indicates that the demand meter kilowatthours are within acceptable limits of the watthour meter kilowatthours.

10.08B(5) Tests of Block-Interval Demand Registers (pointer-form). Tests may be made: with the demand register mounted on a test device, with the demand register mounted on a watthour meter, or with a manually operated register testing device attached to the demand register. Motor-driven or manually operated test equipment will advance the demand register to a selected test point, between 30% and 60% of full-scale value during a demand interval. When the demand register is mounted on a watthour meter, the load applied to the watthour meter will be greater than 30% of the demand register full-scale value. The demand interval will be determined and a billing period reset will be performed to determine that the pointer pusher or test dial pointer returns to zero.

10.08C Instrument Transformers.

10.08C(1) Pre-installation Inspections And Tests. Instrument transformer performance for metering purposes will be measured through accurate ratio and phase-angle tests and voltage-withstand tests. Every instrument transformer will be inspected and tested by Company before being installed for use for customer billing. New transformers may be accepted if the manufacturer provides certification of the accuracy of each transformer.

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10.08 METER TEST PROCEDURES AND ACCURACIES (continued)

10.08C(2) Accuracy. Metering class instrument transformers will be installed. Instruments that do not meet the meter class standard may be used when an associated meter device can provide compensation required to achieve metering class accuracy.

10.09 ROUTINE METER TEST SCHEDULES: Company will test its alternating current watthour meters in accordance with the Company Electric Meter Shop Rules For Inspection and Testing Programs as provided under Iowa Administrative Code 199--20.6.

10.09A A meter removed from a customer's premises will be inspected and tested before it is again placed in service. Meters and associated devices will be tested within 120 days after they are removed from service. The tests will be made before the meters and associated devices are adjusted, repaired, returned to service, or retired.

10.10 OTHER METER TESTS: Company may at any time test any of its meters. Upon written request of Customer, Company will test the accuracy of Customer's meter in accordance with Paragraph 6.12 of these General Rules and Regulations.

10.11 ADJUSTMENT OF METER REGISTRATION: All meter installations with mechanical demand registers shall be designed so that the highest expected annual demand readings to be used for billing will appear in the upper half of the meter's range. Electric meters with electronic demand registers shall not have this restriction.