AVISTA CORPORATION
dba Avista Utilities

RULE NO. 18
METER TESTS AND ADJUSTMENT OF BILLS FOR METER ERROR

A. METER TESTS (T)

1. **Prior to Installation**
Each gas service meter when installed for the use of any Customer, will be in good working order and will have been tested and adjusted, if necessary, to operate within prescribed limits.

2. **Periodic and Other Tests**
   a. Each in service gas meter will be tested, and properly adjusted, if necessary, in accordance with procedures authorized by the Commission. (T)

   b. At any time a meter is observed by a Company employee to be in such a condition or so operating as to cause doubt of its accuracy, it will be tested and readjusted, if necessary, to operate within prescribed limits.

3. **Upon Customer Request** (T)
   a. Any Customer may request the Company to test the meter used to measure their gas usage. Such tests shall be made within 20 working days of the request at no cost to the Customer. The meter test will be conducted at a time mutually agreeable to both Customer and the Company. A Customer has the right to require the Company to conduct the test in their presence or in the presence of an expert or other representative appointed by the Customer. A written report showing the name of the Customer, the date of the request, address where the meter has been installed, the serial number of the meter, the date tested, and the result of the test shall be supplied to the Customer within a reasonable time after completion of the test. (T)

   b. If the Customer requests more than one meter test within any 12-month period, the Company may charge to recover the reasonable cost of the test. The Company shall inform the Customer, prior to the test, that if the meter is found to register within the 2 percent accepted tolerance standard, under normal operating conditions, the Customer shall be required to pay the reasonable costs for the Company performing the meter test. This payment shall be based on a Company formula which allows the Company to recover expenses for payroll, taxes, insurance, and Company vehicle use. (T) (M)

   c. No billing adjustment shall be required if the gas meter registers less than two percent error under conditions of normal operation. (M)

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B. METER TEST PROCEDURES (M)

Technical performance requirements for natural gas meters shall be per the current versions of ANSI B109.1, ANSI B109.2, and ANSI B109.3. (N)

1. **Meter Test Records** (N)
The Company will file its meter testing results for the prior calendar year by April 30 of each year. Retention of records will be in accordance with OAR 860-023-0015(4).

2. **New Meters**
   a. New meters shall be factory tested and certified to meet accuracy criteria specified by OAR 860-023-0015(1).

      i. Formulation of test sample sizes and analysis of test results shall be per ANSI/ASQ Z1.9-2003 (hereinafter may be referred to as the Standard) or any more current version referenced in regulatory requirements. Ongoing manufacturer quality control program results for specific meter types consistent with an AQL value of 1.5 overall performance (double specification limit) and AQL value of 1.0 for fast meters (single specification limit) are acceptable. (T)

   b. Acceptance testing by the Company prior to installation of all new meters. (T) (M)

      i. Each meter shipment will be inspected for physical damage. Meters found to be damaged or in damaged packaging will be tested, repaired and/or calibrated or returned to the manufacturer as described herein. All costs for tests, return shipping and/or calibration to meters described in this section shall be borne by the manufacturer.

      ii. Normal acceptance testing described herein, not associated with physical damage found on arrival of the shipment, will be performed by the Company at the Company's expense. Expanded testing for shipments found to be non-conforming through acceptance testing will be paid for by the manufacturer or the shipment returned to the manufacturer per negotiations between the Company and the manufacturer. (T) (T)

      iii. The lot size to determine random sample quantity shall be the size of the shipment. (M)

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iv. The methodology for the new meter testing program is derived from ANSI/ASQ Z1.9-2003. (M)

c. Acceptance testing of new domestic meters,1000 CFH and smaller. A random sample of new domestic meters, selected using random number procedures of quantity per the Standard, shall be tested against tolerances prescribed by OAR 860-023-0015 and analyzed using the procedures contained in the Standard as detailed herein. (D) (D)

i. Test result analysis: two analysis results will determine the acceptability of a lot.

1) The "standard deviation – *double* specification limit method with variability unknown" as detailed in the Standard shall be used to determine the <u>overall</u> acceptability of a meter type lot. Acceptable Quality Limit (AQL) for analysis will equal **1.5**. Equal weight shall be given to both the upper and lower specification limit (i.e., fast and slow meters are weighted equally). The results of the "Open Test" and the "Check Test" will be averaged; the resulting average number will be used in the procedures for analysis per the Standard. (M) (M)

a) It is the intent of this rule to accomplish testing to verify, with approximately 90% certainty, that the percentage of non-conforming meters does not exceed **3%** of any new meter shipment population.

b) It is further the intent of this specification to insure that the long-term proportion of non-conforming meters to the standard does not exceed **1.5%**.

2) The "standard deviation – *single* specification limit method with variability unknown" as detailed in the Standard shall be used to determine the acceptability of a meter type lot in the <u>fast direction</u> (disadvantageous to the consumer). AQL for analysis will equal **1.0**. The results of the "Open Test" and the "Check Test" will be averaged; the resulting average number will be used in the procedures for analysis per the Standard. (T) (M)

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a) It is the intent of this rule to accomplish testing to verify, with approximately 90% certainty, that the proportion of non-conforming meters to the fast direction is approximately **1%** or less of any new meter shipment population. (T) (M)

b) It is further the intent of this specification to insure that the long-term proportion of non-conforming meters to the standard does not exceed **1.0%**.

ii. Equipment not eligible for random sampling that fail to meet AQL criteria shall be returned to the manufacturer or the entire shipment may be adjusted at the manufacturer's expense. (T)(D)

iii. Tested meters found to be outside the tolerances of OAR 860-023-0015 shall be adjusted to 100% plus or minus 0.5% with no greater than 0.7% spread. If the meter cannot be adjusted to these standards it shall be returned to the manufacturer.

d. Acceptance testing of new diaphragm meters, greater than 1000 CFH, shall be tested against metering tolerances of OAR 860-023-0015. (T) (T)

i. Tested meters found to be outside of tolerance shall be adjusted to 100% plus or minus 0.5%, with no greater spread than 0.7%. If the meter cannot be adjusted within these standards, it shall be returned to the manufacturer. (T)

e. New rotary meters are tested after putting into service. (T)

i. Differential testing confirms a minimum of 3 points for accuracy.

f. New turbine meters are tested after putting into service. (T)

i. Testing confirms a minimum of 2 points within the range of the meter.

3. **Installed Meters Testing Program**

a. Meters shall be periodically inspected and tested against metering tolerances prescribed in OAR 860-023-0015. Meters found to be outside the tolerances of OAR 860-023-0015 shall be immediately adjusted or replaced. If a meter cannot be adjusted, and no replacement meter is immediately available, the inaccurate meter shall be removed and a replacement meter shall be installed as soon as possible. Service will be maintained to the Customer. (T) (D)(M)

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b. The methodology for sample sizes and analysis for the installed meter testing program is derived from ANSI/ASQ Z1.9-2003. (M)(D) (T)

c. Domestic meters, 1000 CFH and smaller. A random sample of domestic meters shall be selected, tested against tolerances prescribed by OAR 860-023-0015, and analysis conducted using the Standard. The random sampling program shall begin during the 5th year after meter installation. (T) (C)

i. A meter population is defined as meters of the same model, size, and manufactured in the same year. Meter population is synonymous with the term lot as used in the Standard.

1) Major design changes to a meter model within a single year shall be a new population for sampling.

ii. A random sample of meters to be tested within a population will be made at the beginning of a calendar year. The random sample may be modified as described below. (T)

1) Every meter in a population will be considered eligible for testing. If service work such as a reported gas odor brings a service person to a meter during the course of the year and the required test quota of meters has not yet been completed, the meter will be eligible for substitution into the sample of the meter population for that year.

2) Eligibility of meters for inclusion into the test population will be tracked electronically through the Work Order Management Program in conjunction with meter test program requirements. An electronic flag will alert the service person if a meter is eligible to be included in the year's test program. The service person will have the option to override the electronic flag if work load at the time does not lend itself to pulling that meter for testing. (T)

3) An individual meter test result of more than 10% error shall be declared a uniquely defective test and disregarded. A substitute test will be made with meter selected by random sample methods.

iii. Test result analysis: two analysis results will determine the acceptability of a lot. (M)(D)

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1) The "standard deviation – *double* specification limit method with variability unknown" as detailed in the Standard shall be used to determine the overall acceptability of a meter type lot. AQL for analysis will equal **10**. Equal weight shall be given to both the upper and lower specification limit (i.e., fast and slow meters are weighted equally). The results of the "Open Test" and the "Check Test" will be averaged; the resulting average number will be the data point for inclusion in analysis of meter type performance.

   a) It is the intent of this rule to accomplish testing to verify, with approximately 90% certainty, that the proportion of non-conforming meters does not exceed **10%** of any installed meter population.

   b) It is further the intent of this specification to verify through continued testing that the long-term proportion of non-conforming meters does not exceed **10%**.

2) The "standard deviation – *single* specification limit method with variability unknown" as detailed in the Standard shall be used to determine the acceptability of a meter type lot in the fast direction (disadvantageous to the Customer). AQL for analysis will equal **10.0**. The results of the "Open Test" and the "Check Test" will be averaged; the resulting average number will be the data point for inclusion in analysis of meter type performance.

   a) It is the intent of this rule to accomplish testing to verify, with approximately 90% certainty, that the proportion of non-conforming meters to the fast direction is less than **10%** of any installed meter population.

   b) It is further the intent of this specification to verify through continued testing that the long-term proportion of non-conforming meters does not exceed **10%**.

3) The intent of the analysis rules contained herein applied to the Standard using Table A-3 and Table A-1 yields: sample size code letters B through P: AQL = 10.0. Table A-3 of the Standard is utilized to determine the applicable AQL curve per the intent of the testing described above. When this point lies between standard

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AQL curves on Table A-3, the AQL curve to be applied shall be chosen per Table A-1 of the Standard. (M)

iv. Inspection levels:

1) Normal inspection is the default level of inspection and shall be per the procedures contained in the Standard utilizing tables A-2, A-3, and B-3. (D)

2) Reduced inspection shall be per the procedures contained in the Standard utilizing tables A-2, A-3, and B-4. (D)

v. Inspection levels for existing meter types with 5 year test histories are eligible for reduced testing per guidelines contained within the Standard. Analysis of test results for the time prior to adoption of this tariff for defined populations may be used to determine application of switching rules. (D)

vi. Switching rules: (D)

1) Normal to Reduced: Switching rules for transition from normal to reduced inspection shall be applied if the preceding 5 lots have been on normal inspection and none have been rejected. (T)

a) This is a modification to the guidelines contained in A10.3.3 of the Standard. Five lots passing normal inspection have been specified in lieu of ten to reflect the historically slow changing performance of installed equipment. (D)

vii. Discontinuance of random sampling; failure of meter population. A meter population shall be declared defective and removed from service when: (D)

1) An annual inspection of a population is not accepted based on AQL of 10.0 for overall performance (double specification limit), *or* (D) (C)

2) An annual inspection of a population under normal inspection are found to be non-conforming fast meters in excess of OAR 860-023-0015 tolerances based on an AQL value of 10.0 (single specification limit). (C) (T) (D) (D)

(M)

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viii. Tested meters found to be outside the tolerances of OAR 860-23-0015 shall be adjusted to 100% plus or minus 0.5% with no greater than 0.7% spread before returning to service. If the meter cannot be adjusted to these standards it shall be removed from service and inventory; the Company will pursue compensation under any applicable manufacturer warranties. . (T) (T) (N)

d. Installed diaphragm meters, greater than 1000 CFH.

i. Meters 1001 CFH through 3000 CFH are inspected and proved every five (5) years or sooner. (N)

ii. Meters larger than 3000 CFH are inspected and proved every five (5) years or sooner.

iii. All meters shall be tested against metering tolerances of OAR 860-023-0015.

iv. Meters found to be outside of tolerance shall be adjusted to 100% plus or minus 0.5%, with no greater spread than 0.7%, or will be removed from service and inventory; the Company will pursue compensation under any applicable manufacturer warranties. (T) (T) (N) (N)

e. Installed rotary meters shall be be inspected and tested every five (5) years or sooner by differential testing or using proving equipment. (T) (T)

i. Meters inspected by differential testing shall confirm that the meter is performing within 150% of the manufacturer's specification for differential pressure at the operating pressure.

ii. Every meter tested by proving shall confirm that the meter is operating within the tolerances of OAR 860-023-0015. Meters found to be outside of tolerance shall be adjusted to be not more than 2.0% slow or fast, or will be removed from service and inventory the Company will pursue compensation under any applicable manufacturer warranties. (N) (N)

f. Installed turbine meters.

i. Installed single rotor turbine meters shall be inspected and spin tested annually and determined to be within the manufacturer's acceptability limits. Turbine meters failing the spin test shall be removed from the field and repaired prior to any subsequent installation. (M)

(M)

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(M)

ii. Installed auto adjust meters shall be inspected annually and determined to be operating within the manufacturer's acceptability limits. Meter Delta A (ΔA), the difference between the main and sensing rotor pulses, that exceed the manufacturer's recommended operating parameters shall be repaired or replaced.

iii. Turbine meters are proof tested against metering tolerances of OAR 860-023-0015. (T)

iv. Meters found to be outside of tolerance shall be adjusted to 100% plus or minus 0.5%, with no greater spread than 0.7%, or will be removed from service and inventory; the Company will pursue compensation under any applicable manufacturer warranties. (N) (N)

4. **Meter Test Equipment and Application** (T)
Meters shall be tested on either a Sonic Nozzle, Bell Prover, or Transfer Prover.

a. Roots 10-M Transfer Prover. The accuracy of the testing equipment is ascertained through: i) Monthly in-house self-testing procedures, and ii) Sending of Standard Meter Module to the manufacturer for periodic calibration. The period between factory calibration shall not exceed five (5) years.

b. American Meter Sonic Nozzle Prover and American Meter Bell Prover. The accuracy of the testing equipment is ascertained through an automatic test diagnostic, which is completed each time the prover is powered on. The test equipment shall be factory calibrated every two (2) years. (T)

C. ADJUSTMENT OF BILLS FOR METER ERROR

Billing adjustments due to fast meters will be calculated on the basis that the meter should be 100% accurate. For the purpose of billing adjustment, the average error of the check rate and the open rate flow will be used.

1. Fast Meters: When, upon test, any meter is found to be registering more than 2% fast, the Company will refund or credit to the Customer the amount of the overcharge based on corrected meter readings. The period of time over which a refund is to be calculated is described in Rule No. 9 Section C.1.

(M)