

**IDAPA 31 – PUBLIC UTILITIES COMMISSION**

**31.61.01 – RULES FOR THE MEASUREMENT OF  
STRAY CURRENT OR VOLTAGE  
(THE STRAY VOLTAGE RULES)**

**DOCKET NO. 31-6101-0501**

**NOTICE OF RULEMAKING  
PENDING RULE AND AMENDMENT TO TEMPORARY RULE**

**EFFECTIVE DATE:** The effective date of the amendment to the temporary rule is December 7, 2005. This pending rule has been adopted by the Commission and is now pending review by the 2006 Idaho State Legislature for final approval. The pending rule becomes final and effective at the conclusion of the legislative session, unless the rule is approved, rejected, amended or modified by concurrent resolution in accordance with Sections 67-5224 and 67-5291, Idaho Code. If the pending rule is approved, amended or modified by concurrent resolution, the rule becomes final and effective upon adoption of the concurrent resolution or upon the date specified in the concurrent resolution.

**AUTHORITY:** In compliance with Sections 67-5224 and 67-5226, Idaho Code, notice is hereby given that the Commission has adopted a pending rule and amended a temporary rule. The action is authorized pursuant to Section 61-803, Idaho Code.

**DESCRIPTIVE SUMMARY:** The following is a concise explanatory statement of the reasons for adopting the pending rule and amending the temporary rule and a statement of any change between the text of the proposed rule and the text of the pending rule with an explanation of the reasons for the change.

The Commission's Stray Voltage Rules standardize the measurement and testing procedures used to measure stray voltage and current at dairy farms. Idaho Power Company recommended four (4) changes to the proposed rules. First, Idaho Power suggested that Rule 71 be amended so that the testing utility is permitted to conduct the six (6) stray voltage tests in any sequence. Second, the Company proposed that Rule 71 be amended to allow the stray voltage investigation be suspended or limited in instance where the testing utility and the dairy producer agree in writing. Third, Idaho Power suggested changing Rule 74 to reduce the duration of Test 2 (the forty-eight (48) hour test) in instances where it is clearly determined that the utility must conduct remediation for stray voltage or current. The Commission Staff, the Idaho Dairymens' Association and the Milk Producers of Idaho all supported the changes including a clarification to Rule 71.03. The Commission adopted the recommended changes.

Idaho Power also recommended changing Rule 75 that requires the utility to conduct stray voltage measurements within three quarters (3/4) of a mile on either side of all primary service points and "on all branch lines encountered within this specific distance." Idaho Power recommended reducing the testing distance to one half (1/2) mile and deleting the testing of

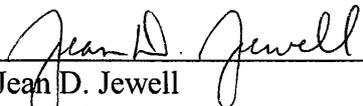
branch lines. The dairy organizations and the Staff supported deletion of the branch line testing but opposed the distance reduction. The Commission amended Rule 75 to delete the testing of "branch lines" but declines to reduce the area subject to testing.

As set out above, the text of the pending rule has been amended in accordance with Section 67-5227, Idaho Code, and is being republished following this notice. Rather than keep the temporary rule in place while the pending rule awaits legislative approval, the Commission amends the temporary rule with the same revisions which have been made to the pending rule. Only the sections that have changes different from the proposed text are printed in this bulletin. The original text of the proposed rule was published in the September 7, 2005 Idaho Administrative Bulletin, Vol. 05-9, pages 267-300.

**FISCAL IMPACT:** The following is a specific description, if applicable, of any negative fiscal impact on the state general fund greater than ten thousand dollars (\$10,000) during the fiscal year: N/A

**ASSISTANCE ON TECHNICAL QUESTIONS:** For assistance on technical questions concerning the pending rule and the amendment to the temporary rule, contact Donald L. Howell, II, Deputy Attorney General, (208) 334-0312.

DATED at Boise, Idaho this 26<sup>th</sup> day of October 2005.

  
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Jean D. Jewell  
Commission Secretary  
Idaho Public Utilities Commission  
PO Box 83720  
Boise, ID 83720-0074  
Telephone: (208) 334-0338  
Facsimile: (208) 334-3762

**THE IDAHO PUBLIC UTILITIES COMMISSION--AGENCY 31  
TITLE 61  
CHAPTER 1**

**RULES FOR THE MEASUREMENT OF  
STRAY CURRENT OR VOLTAGE  
(THE STRAY VOLTAGE RULES)**

**IDAPA 31.61.01.000**

**071. STRAY CURRENT OR VOLTAGE TESTS (Rule 71).**

Subject to Subsection 071.02 of this rule, there are six (6) tests used to detect and measure stray current or voltage. (9-14-05)T

**01. Order Scheduling of Stray Voltage Tests.** ~~The tests shall be performed in the order listed below.~~ Efforts shall be made to perform the tests under conditions substantially similar to those conditions existing at the time(s) the dairy producer believes stray voltage to be a problem. (9-14-05)(12-7-05)T

- a. Test 1 – Cow Contact Test; (9-14-05)T
- b. Test 2 – Forty-Eight (48) Hour Test; (9-14-05)T
- c. Test 3 – Primary Profile Test; (9-14-05)T
- d. Test 4 – Secondary Neutral Voltage Drop Test; (9-14-05)T
- e. Test 5 – Load Box Test; and (9-14-05)T
- f. Test 6 – Signature Test. (9-14-05)T

**02. Testing Sequence.** Tests 1 and 2 shall be performed first to determine the presence and level of stray voltage. Tests 1 and 2 are used to determine the presence and level of stray voltage and shall be performed in all investigations, subject to the provisions of Subsection 071.03. Tests 3, 4, 5, and 6 may be performed in any order and may be performed without first determining that these tests are required under Paragraph 071.02.b. Tests 3, 4, 5, and 6 may be performed prior to starting the recording for Test 2 or while Test 2 is in progress. Test 2 may be interrupted as necessary to conduct Tests 4, 5, and 6, or for review and analysis of the data recorded up to that point. (9-14-05)(12-7-05)T

a. If the results from Tests 1 and 2 indicate that stray voltage does not exceed the preventive action level (PAL), the utility has no further testing or remediation obligations under these rules during this test cycle. (9-14-05)T

b. If the PAL is exceeded, the utility shall perform the remaining four (4) tests except as provided in Subsection 071.03. The utility shall also perform analysis to determine whether the portion of the stray current or voltage attributable to an off-farm source exceeds fifty percent (50%) of the PAL. ~~(9-14-05)~~(12-7-05)T

c. If the PAL is exceeded, and the portion of the stray current or voltage attributable to an off-farm source does not exceed fifty percent (50%) of the PAL, the utility has no further testing or remediation obligations. (9-14-05)T

d. If the PAL is exceeded, and the portion of the stray current or voltage attributable to an off-farm source exceeds fifty percent (50%) of the PAL, the utility shall conduct remediation pursuant to Section 091. Under this condition, the forty-eight (48) hour recording of Test 2 may be reduced to no fewer than twenty-four (24) hours. ~~(9-14-05)~~(12-7-05)T

e. For all testing conducted under these rules, the utility shall have a qualified analyst prepare a report pursuant to Section 082. (9-14-05)T

**03. Suspended or Limited Testing.** With the written agreement of both the utility and the dairy producer, a stray voltage investigation may be suspended at any point in the investigation. With the written agreement of both the utility and the dairy producer, the utility may employ a limited set of tests or measurements on a dairy as part of an intentionally limited evaluation. If the utility proposes to suspend a stray voltage investigation or to conduct a limited evaluation, its reasons for doing so shall be set forth in the written agreement between the utility and the dairy producer. (12-7-05)T

(BREAK IN CONTINUITY OF SECTIONS)

**074. TEST 2 – FORTY-EIGHT (48) HOUR TEST (Rule 74).**

**01. Purpose.** The purpose of this test is to determine whether stray current or voltage exceeds the preventive action level (PAL) at selected location(s) over a forty-eight (48) hour period, subject to Subsection 074.06 and Paragraph 071.02.d. The test also demonstrates whether the primary or secondary sides of the system have a specific impact on the recorded current or voltage at specific times of day. ~~(9-14-05)~~(12-7-05)T

**02. Setup.** A digitizing data recorder with averaging capability and capable of detecting and recording transient deviations of one-tenth (0.1) second or less in duration shall be used to record the following: (9-14-05)T

a. Voltage from primary neutral at the transformer to remote reference ground, Vp. (9-14-05)T

b. Voltage from secondary neutral in the service panel serving the area of the cow contact to remote reference ground, Vs. (9-14-05)T

c. Voltage drops (Vps) from primary neutral at the location of connection for Vp to secondary neutral at the location of the connection for Vs. (9-14-05)T

d. Cow contact current through (Icc) or voltage across a five hundred (500) ohm resistor at the high voltage point(s) found in Test 1, Vcc. (9-14-05)T

**03. Measurement Interval.** The results of the forty-eight (48) hour test may be highly indicative of the presence of stray voltage. A recording interval as high as ten (10) seconds may be used provided that transient deviations of voltage or current of one-tenth (0.1) second or less in duration of voltage or current are recorded to the maximum ability of the instrument. (9-14-05)T

**04. Measurement at the Cow Contact Point(s).** Measurements to the earth or concrete surface shall be to a metal plate as described in Paragraph 073.03.c. ~~w~~When making measurements to metal objects, corrosion shall be removed to obtain a low resistance connection. (9-14-05)(12-7-05)T

**05. Recording the Data.** All of the data gathered by the recording equipment during the forty-eight (48) hour test including transients shall be downloaded and retained with the records of the investigation. In addition, the steady-state data shall be summarized in the investigation report. The recorded data shall be made available to the dairy producer or utility upon request. The person conducting this test shall record the location of, and measured values at, each test point. The identification of the cow contact point shall be recorded on the form in Appendix 2. Transient deviations shall be recorded on the supplemental data form, page 3 of 3 in Appendix 2. A plot of the voltage versus time may be substituted for the recording of measured values in Appendix 2. (9-14-05)T

**06. Reduced Recording Period.** If a qualified analyst concludes that remediation by the utility is required under Paragraph 071.02.d. prior to the completion of a forty-eight (48) hour recording period, the recording period may be reduced to no fewer than twenty-four (24) hours. (12-7-05)T

#### **075. TEST 3 – PRIMARY PROFILE TEST (Rule 75).**

**01. Purpose.** The purpose of this test is to measure or calculate neutral-to-earth voltage (NEV) for a multi-grounded distribution system. (9-14-05)T

**02. Conducting the Test.** The primary profile test requires concurrent measurement of the ground electrode resistance and current at all primary system ground points within three quarters (3/4) of a mile on either side of all primary service points serving the dairy, or to the end of the line if less than three quarters (3/4) of a mile. Alternatively, the voltage between a remote grounding rod and the primary ground point being tested may be measured. (9-14-05)T

a. This test shall be conducted starting at one end of the distribution system and working toward the other end along the main primary distribution system ~~while checking all~~

~~branch lines encountered within the specified distance.~~ Figure 4 below illustrates the procedure.  
(9-14-05)(12-7-05)T

i. Where the dairy is served by a dedicated tap of less than one half (1/2) mile in length from a distribution line, the neutral-to-earth voltage shall be measured at each primary ground along the tap and along the distribution line to a distance of three quarters (3/4) of a mile in each direction from the point of the tap; or  
(9-14-05)T

ii. Where a dairy is served by a dedicated tap that extends more than one half (1/2) mile from the distribution line, the neutral-to-earth voltage shall be measured at each primary grounding electrode along the tap and along the distribution line to a distance of one half (1/2) mile in each direction from the point of the tap.  
(9-14-05)T

**03. Recording the Data.** The person conducting this test shall record the location of, and measured values at, each test point. Data and calculation results for these test points shall be recorded on the form in Appendix 3.  
(9-14-05)T