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December 15, 2009

Darrell Nitschke
Director of Administration/Executive Secretary
North Dakota Public Service Commission
State Capitol
600 East Boulevard, Dept. 408
Bismarck, ND 58505-0408

RE: Otter Tail Power Company's 2009 Sample Meter Test Performance Report

Dear Mr. Nitschke:

Pursuant to North Dakota Rule 69-09-02-28(3), enclosed, as Attachment 1, are the results from the 2009 single-phase kWh sample meter test program for Otter Tail Power Company. There were eight groups of meters selected for the 2009 sample test. Criterion for selecting the groups was based on the time period the meters were purchased, manufacturer and model of meters. The meters were grouped as follows:

1. GE and SI meters purchased from 1999 to present.
2. GE model I70S meters purchased from 1969 to 1998.
3. SI model J4S, J5S meters purchased from 1969 to 1998.
4. LG model MS, MX meters purchased from 1969 to 1998.
5. ABB model D4S meters purchased from 1969 to 1974.
6. ABB model D4S meters purchased from 1975 to 1982.
7. ABB model D5S meters purchased from 1990 to 1998.
8. GE model I50S meters.

Mr. Darrell Nitschke

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December 15, 2009

The results of the Sample test this year indicate that the ABB meters manufactured from 1990 to 1998 failed the Sample test. There are 3,160 of these meters in service. These meters will be removed from service within the next five years. The other groups passed the test and are performing satisfactorily.

In 2008, the ABB Model AB1 meters failed the Sample test. There are about 4,700 of these meters in service. In 2007, a range of ABB meters manufactured from 1983 to 1985 failed the test. These meters are being removed from service. All other groups of meters that have failed the Sample test in past years have been removed from service.

An electronic copy of this filing is being sent to you at dnitschk@nd.gov and to ndpsc@nd.gov. These items are filed for your information. If you have any questions, please contact me at 218-739-8395 or jheinen@otpc.com.

Very truly yours,

/s/ JUDY HEINEN

Judy Heinen

Tariff Specialist, Regulatory Services

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Enclosures

By electronic filing

**SAMPLE METER TEST CALCULATION FORM
METERS IN SERVICE AT OTTER TAIL POWER CO.**

REFERENCE - TABLES A-2, B-3, B-4, B-5, AND EXAMPLE B-3 OF MIL-STD-414.

TYPE OF METERS IN THIS SAMPLE: 2009 Sample #1

LOT SIZE _____ SAMPLE SIZE 178 AQL 2.5

FL BAR X 99.821 **FL SIGMA** 0.291
LL BAR X 99.556 **LL SIGMA** 0.505

ESTIMATE OF LOT ABOVE 102.0%

$$FL\ QU = \frac{102 - FL\ BAR\ X}{FL\ SIGMA} = \frac{102 - 99.821}{0.291} = \frac{2.179}{0.291} = \underline{7.49}$$

$$LL\ QU = \frac{102 - LL\ BAR\ X}{LL\ SIGMA} = \frac{102 - 99.556}{0.505} = \frac{2.444}{0.505} = \underline{4.84}$$

From Table B-5 = 0 % PU FL above 102.0%

0 % PU LL above 102.0 %

ESTIMATE OF LOT BELOW 98.0%

$$FL\ QL = \frac{FL\ BAR\ X - 98}{FL\ SIGMA} = \frac{99.821 - 98}{0.291} = \frac{1.821}{0.291} = \underline{6.26}$$

$$LL\ QL = \frac{LL\ BAR\ X - 98}{LL\ SIGMA} = \frac{99.556 - 98}{0.505} = \frac{1.556}{0.505} = \underline{3.08}$$

From table B-5 = 0 % PL FL below 98.0 %

0.092 % PL LL below 98.0 %

TOTAL PERCENT DEFECTIVE

Full Load P = PU FL + PL FL 0 + 0 = 0.000

Light Load P = PU LL + PL LL 0 + 0.092 = 0.092

ALLOWABLE PERCENT DEFECTIVE: TABLE B-3 4.4

OUTLIERS

UFL = FL BAR X + (4 x FL Sigma) 99.821 + 1.164 UFL = 100.985

LFL = FL BAR X - (4 x FL Sigma) 99.821 - 1.164 LFL = 98.657

ULL = LL BAR X + (4 x LL Sigma) 99.556 + 2.02 ULL = 101.576

LLL = LL BAR X - (4 x LL Sigma) 99.556 - 2.02 LLL = 97.536

Lot is acceptable x Lot is unacceptable _____

Tested & Reported by: Steve Ness 12-2-09

Approved: Wes Evavold 12-9-09

**SAMPLE METER TEST CALCULATION FORM
METERS IN SERVICE AT OTTER TAIL POWER CO.**

REFERENCE - TABLES A-2, B-3, B-4, B-5, AND EXAMPLE B-3 OF MIL-STD-414.

TYPE OF METERS IN THIS SAMPLE: 2009 Sample #2

LOT SIZE _____ SAMPLE SIZE 95 AQL 2.5

FL BAR X 100.005 **FL SIGMA** 0.204
LL BAR X 99.631 **LL SIGMA** 0.481

ESTIMATE OF LOT ABOVE 102.0%

$$FL\ QU = \frac{102 - FL\ BAR\ X}{FL\ SIGMA} = \frac{102 - 100.005}{0.204} = \frac{1.995}{0.204} = \underline{9.78}$$

$$LL\ QU = \frac{102 - LL\ BAR\ X}{LL\ SIGMA} = \frac{102 - 99.631}{0.481} = \frac{2.369}{0.481} = \underline{4.93}$$

From Table B-5 = 0 % PU FL above 102.0%

0 % PU LL above 102.0 %

ESTIMATE OF LOT BELOW 98.0%

$$FL\ QL = \frac{FL\ BAR\ X - 98}{FL\ SIGMA} = \frac{100.005 - 98}{0.204} = \frac{2.005}{0.204} = \underline{9.83}$$

$$LL\ QL = \frac{LL\ BAR\ X - 98}{LL\ SIGMA} = \frac{99.631 - 98}{0.481} = \frac{1.631}{0.481} = \underline{3.39}$$

From table B-5 = 0 % PL FL below 98.0 %

0.024 % PL LL below 98.0 %

TOTAL PERCENT DEFECTIVE

Full Load P = PU FL + PL FL 0 + 0 = 0.000

Light Load P = PU LL + PL LL 0 + 0.024 = 0.024

ALLOWABLE PERCENT DEFECTIVE: TABLE B-3 4.69

OUTLIERS

UFL = FL BAR X + (4 x FL Sigma) 100.005 + 0.816 UFL = 100.821

LFL = FL BAR X - (4 x FL Sigma) 100.005 - 0.816 LFL = 99.189

ULL = LL BAR X + (4 x LL Sigma) 99.631 + 1.924 ULL = 101.555

LLL = LL BAR X - (4 x LL Sigma) 99.631 - 1.924 LLL = 97.707

Lot is acceptable x Lot is unacceptable _____

Tested & Reported by: Steve Ness 12-02-09

Approved: Wes Evavold 12-9-09

**SAMPLE METER TEST CALCULATION FORM
METERS IN SERVICE AT OTTER TAIL POWER CO.**

REFERENCE - TABLES A-2, B-3, B-4, B-5, AND EXAMPLE B-3 OF MIL-STD-414.

TYPE OF METERS IN THIS SAMPLE: 2009 Sample #3

LOT SIZE _____ SAMPLE SIZE 99 AQL 2.5

FL BAR X 99.855 **FL SIGMA** 0.436
LL BAR X 99.656 **LL SIGMA** 0.634

ESTIMATE OF LOT ABOVE 102.0%

$$FL\ QU = \frac{102 - FL\ BAR\ X}{FL\ SIGMA} = \frac{102 - 99.855}{0.436} = \frac{2.145}{0.436} = \underline{4.92}$$

$$LL\ QU = \frac{102 - LL\ BAR\ X}{LL\ SIGMA} = \frac{102 - 99.656}{0.634} = \frac{2.344}{0.634} = \underline{3.70}$$

From Table B-5 = 0 % PU FL above 102.0%

0.006 % PU LL above 102.0 %

ESTIMATE OF LOT BELOW 98.0%

$$FL\ QL = \frac{FL\ BAR\ X - 98}{FL\ SIGMA} = \frac{99.855 - 98}{0.436} = \frac{1.855}{0.436} = \underline{4.25}$$

$$LL\ QL = \frac{LL\ BAR\ X - 98}{LL\ SIGMA} = \frac{99.656 - 98}{0.634} = \frac{1.656}{0.634} = \underline{2.61}$$

From table B-5 = 0 % PL FL below 98.0 %

0.402 % PL LL below 98.0 %

TOTAL PERCENT DEFECTIVE

Full Load P = PU FL + PL FL 0 + 0 = 0.000

Light Load P = PU LL + PL LL 0.006 + 0.402 = 0.408

ALLOWABLE PERCENT DEFECTIVE: TABLE B-3 4.69

OUTLIERS

UFL = FL BAR X + (4 x FL Sigma) 99.855 + 1.744 UFL = 101.599

LFL = FL BAR X - (4 x FL Sigma) 99.855 - 1.744 LFL = 98.111

ULL = LL BAR X + (4 x LL Sigma) 99.656 + 2.536 ULL = 102.192

LLL = LL BAR X - (4 x LL Sigma) 99.656 - 2.536 LLL = 97.12

Lot is acceptable x Lot is unacceptable _____

Tested & Reported by: Steve Ness 12-02-09

Approved: Wes Evavold 12-9-09

SAMPLE METER TEST CALCULATION FORM

METERS IN SERVICE AT OTTER TAIL POWER CO.

REFERENCE - TABLES A-2, B-3, B-4, B-5, AND EXAMPLE B-3 OF MIL-STD-414.

TYPE OF METERS IN THIS SAMPLE: 2009 Sample #4

LOT SIZE _____ SAMPLE SIZE 95 AQL 2.5

FL BAR X 99.954

FL SIGMA 0.313

LL BAR X 99.609

LL SIGMA 0.508

ESTIMATE OF LOT ABOVE 102.0%

$$FL\ QU = \frac{102 - FL\ BAR\ X}{FL\ SIGMA} = \frac{102 - 99.954}{0.313} = \frac{2.046}{0.313} = \underline{6.54}$$

$$LL\ QU = \frac{102 - LL\ BAR\ X}{LL\ SIGMA} = \frac{102 - 99.609}{0.508} = \frac{2.391}{0.508} = \underline{4.71}$$

From Table B-5 = 0 % PU FL above 102.0%

0 % PU LL above 102.0 %

ESTIMATE OF LOT BELOW 98.0%

$$FL\ QL = \frac{FL\ BAR\ X - 98}{FL\ SIGMA} = \frac{99.954 - 98}{0.313} = \frac{1.954}{0.313} = \underline{6.24}$$

$$LL\ QL = \frac{LL\ BAR\ X - 98}{LL\ SIGMA} = \frac{99.609 - 98}{0.508} = \frac{1.609}{0.508} = \underline{3.17}$$

From table B-5 = 0 % PL FL below 98.0 %

0.058 % PL LL below 98.0 %

TOTAL PERCENT DEFECTIVE

Full Load P = PU FL + PL FL 0 + 0 = 0.000

Light Load P = PU LL + PL LL 0 + 0.058 = 0.058

ALLOWABLE PERCENT DEFECTIVE: TABLE B-3 4.69

OUTLIERS

UFL = FL BAR X + (4 x FL Sigma) 99.954 + 1.252 UFL = 101.206

LFL = FL BAR X - (4 x FL Sigma) 99.954 - 1.252 LFL = 98.702

ULL = LL BAR X + (4 x LL Sigma) 99.609 + 2.032 ULL = 101.641

LLL = LL BAR X - (4 x LL Sigma) 99.609 - 2.032 LLL = 97.577

Lot is acceptable x Lot is unacceptable _____

Tested & Reported by: Steve Ness 12-2-09

Approved: Wes Evavold 12-9-09

SAMPLE METER TEST CALCULATION FORM

METERS IN SERVICE AT OTTER TAIL POWER CO.

REFERENCE - TABLES A-2, B-3, B-4, B-5, AND EXAMPLE B-3 OF MIL-STD-414.

TYPE OF METERS IN THIS SAMPLE: 2009 Sample #5

LOT SIZE _____ SAMPLE SIZE 94 AQL 2.5

FL BAR X 99.974 **FL SIGMA** 0.323
LL BAR X 99.682 **LL SIGMA** 0.893

ESTIMATE OF LOT ABOVE 102.0%

$$FL\ QU = \frac{102 - FL\ BAR\ X}{FL\ SIGMA} = \frac{102 - 99.974}{0.323} = \frac{2.026}{0.323} = \underline{6.27}$$

$$LL\ QU = \frac{102 - LL\ BAR\ X}{LL\ SIGMA} = \frac{102 - 99.682}{0.893} = \frac{2.318}{0.893} = \underline{2.60}$$

From Table B-5 = 0 % PU FL above 102.0%

0.413 % PU LL above 102.0 %

ESTIMATE OF LOT BELOW 98.0%

$$FL\ QL = \frac{FL\ BAR\ X - 98}{FL\ SIGMA} = \frac{99.974 - 98}{0.323} = \frac{1.974}{0.323} = \underline{6.11}$$

$$LL\ QL = \frac{LL\ BAR\ X - 98}{LL\ SIGMA} = \frac{99.682 - 98}{0.893} = \frac{1.682}{0.893} = \underline{1.88}$$

From table B-5 = 0 % PL FL below 98.0 %

2.92 % PL LL below 98.0 %

TOTAL PERCENT DEFECTIVE

Full Load P = PU FL + PL FL 0 + 0 = 0.000

Light Load P = PU LL + PL LL 0.413 + 2.92 = 3.333

ALLOWABLE PERCENT DEFECTIVE: TABLE B-3 4.4

OUTLIERS

UFL = FL BAR X + (4 x FL Sigma) 99.974 + 1.292 UFL = 101.266

LFL = FL BAR X - (4 x FL Sigma) 99.974 - 1.292 LFL = 98.682

ULL = LL BAR X + (4 x LL Sigma) 99.682 + 3.572 ULL = 103.254

LLL = LL BAR X - (4 x LL Sigma) 99.682 - 3.572 LLL = 96.11

Lot is acceptable x Lot is unacceptable _____

Tested & Reported by: Steve Ness 12-02-09

Approved: Wes Evavold 12-9-09

**SAMPLE METER TEST CALCULATION FORM
METERS IN SERVICE AT OTTER TAIL POWER CO.**

REFERENCE - TABLES A-2, B-3, B-4, B-5, AND EXAMPLE B-3 OF MIL-STD-414.

TYPE OF METERS IN THIS SAMPLE: 2009 Sample #6

LOT SIZE _____ SAMPLE SIZE 91 AQL 2.5

FL BAR X 99.922 **FL SIGMA** 0.334
LL BAR X 99.603 **LL SIGMA** 0.756

ESTIMATE OF LOT ABOVE 102.0%

$$FL\ QU = \frac{102 - FL\ BAR\ X}{FL\ SIGMA} = \frac{102 - 99.922}{0.334} = \frac{2.078}{0.334} = \underline{6.22}$$

$$LL\ QU = \frac{102 - LL\ BAR\ X}{LL\ SIGMA} = \frac{102 - 99.603}{0.756} = \frac{2.397}{0.756} = \underline{3.17}$$

From Table B-5 = 0 % PU FL above 102.0%
0.058 % PU LL above 102.0 %

ESTIMATE OF LOT BELOW 98.0%

$$FL\ QL = \frac{FL\ BAR\ X - 98}{FL\ SIGMA} = \frac{99.922 - 98}{0.334} = \frac{1.922}{0.334} = \underline{5.75}$$

$$LL\ QL = \frac{LL\ BAR\ X - 98}{LL\ SIGMA} = \frac{99.603 - 98}{0.756} = \frac{1.603}{0.756} = \underline{2.12}$$

From table B-5 = 0 % PL FL below 98.0 %
1.62 % PL LL below 98.0 %

TOTAL PERCENT DEFECTIVE

Full Load P = PU FL + PL FL 0 + 0 = 0.000

Light Load P = PU LL + PL LL 0.058 + 1.62 = 1.678

ALLOWABLE PERCENT DEFECTIVE: TABLE B-3 4.69

OUTLIERS

UFL = FL BAR X + (4 x FL Sigma) 99.922 + 1.336 UFL = 101.258

LFL = FL BAR X - (4 x FL Sigma) 99.922 - 1.336 LFL = 98.586

ULL = LL BAR X + (4 x LL Sigma) 99.603 + 3.024 ULL = 102.627

LLL = LL BAR X - (4 x LL Sigma) 99.603 - 3.024 LLL = 96.579

Lot is acceptable x Lot is unacceptable _____

Tested & Reported by: Steve Ness 12-2-09

Approved: Wes Evavold 12-9-09

**SAMPLE METER TEST CALCULATION FORM
METERS IN SERVICE AT OTTER TAIL POWER CO.**

REFERENCE - TABLES A-2, B-3, B-4, B-5, AND EXAMPLE B-3 OF MIL-STD-414.

TYPE OF METERS IN THIS SAMPLE: 2009 Sample #7

LOT SIZE _____ SAMPLE SIZE 96 AQL 2.5

FL BAR X 99.739 **FL SIGMA** 0.294
LL BAR X 99.025 **LL SIGMA** 0.891

ESTIMATE OF LOT ABOVE 102.0%

$$FL\ QU = \frac{102 - FL\ BAR\ X}{FL\ SIGMA} = \frac{102 - 99.739}{0.294} = \frac{2.261}{0.294} = \underline{7.69}$$

$$LL\ QU = \frac{102 - LL\ BAR\ X}{LL\ SIGMA} = \frac{102 - 99.025}{0.891} = \frac{2.975}{0.891} = \underline{3.34}$$

From Table B-5 = 0 % PU FL above 102.0%

0.03 % PU LL above 102.0 %

ESTIMATE OF LOT BELOW 98.0%

$$FL\ QL = \frac{FL\ BAR\ X - 98}{FL\ SIGMA} = \frac{99.739 - 98}{0.294} = \frac{1.739}{0.294} = \underline{5.91}$$

$$LL\ QL = \frac{LL\ BAR\ X - 98}{LL\ SIGMA} = \frac{99.025 - 98}{0.891} = \frac{1.025}{0.891} = \underline{1.15}$$

From table B-5 = 0 % PL FL below 98.0 %

12.49 % PL LL below 98.0 %

TOTAL PERCENT DEFECTIVE

Full Load P = PU FL + PL FL 0 + 0 = 0.000

Light Load P = PU LL + PL LL 0.03 + 12.49 = 12.520

ALLOWABLE PERCENT DEFECTIVE: TABLE B-3 4.69

OUTLIERS

UFL = FL BAR X + (4 x FL Sigma) 99.739 + 1.176 UFL = 100.915

LFL = FL BAR X - (4 x FL Sigma) 99.739 - 1.176 LFL = 98.563

ULL = LL BAR X + (4 x LL Sigma) 99.025 + 3.564 ULL = 102.589

LLL = LL BAR X - (4 x LL Sigma) 99.025 - 3.564 LLL = 95.461

Lot is acceptable _____ Lot is unacceptable x

Tested & Reported by: Steve Ness 12-02-09

Approved: Wes Evavold 12-9-09

SAMPLE METER TEST CALCULATION FORM

METERS IN SERVICE AT OTTER TAIL POWER CO.

REFERENCE - TABLES A-2, B-3, B-4, B-5, AND EXAMPLE B-3 OF MIL-STD-414.

TYPE OF METERS IN THIS SAMPLE: 2009 Sample #8

LOT SIZE _____ SAMPLE SIZE 94 AQL 2.5

FL BAR X 100.055

FL SIGMA 0.235

LL BAR X 99.920

LL SIGMA 0.612

ESTIMATE OF LOT ABOVE 102.0%

$$FL\ QU = \frac{102 - FL\ BAR\ X}{FL\ SIGMA} = \frac{102 - 100.055}{0.235} = \frac{1.945}{0.235} = 8.28$$

$$LL\ QU = \frac{102 - LL\ BAR\ X}{LL\ SIGMA} = \frac{102 - 99.92}{0.612} = \frac{2.080}{0.612} = 3.40$$

From Table B-5 = 0 % PU FL above 102.0%

0.023 % PU LL above 102.0 %

ESTIMATE OF LOT BELOW 98.0%

$$FL\ QL = \frac{FL\ BAR\ X - 98}{FL\ SIGMA} = \frac{100.055 - 98}{0.235} = \frac{2.055}{0.235} = 8.74$$

$$LL\ QL = \frac{LL\ BAR\ X - 98}{LL\ SIGMA} = \frac{99.92 - 98}{0.612} = \frac{1.920}{0.612} = 3.14$$

From table B-5 = 0 % PL FL below 98.0 %

0.065 % PL LL below 98.0 %

TOTAL PERCENT DEFECTIVE

Full Load P = PU FL + PL FL 0 + 0 = 0.000

Light Load P = PU LL + PL LL 0.023 + 0.065 = 0.088

ALLOWABLE PERCENT DEFECTIVE: TABLE B-3 4.69

OUTLIERS

UFL = FL BAR X + (4 x FL Sigma) 100.055 + 0.94 UFL = 100.995

LFL = FL BAR X - (4 x FL Sigma) 100.055 - 0.94 LFL = 99.115

ULL = LL BAR X + (4 x LL Sigma) 99.920 + 2.448 ULL = 102.368

LLL = LL BAR X - (4 x LL Sigma) 99.920 - 2.448 LLL = 97.472

Lot is acceptable x Lot is unacceptable _____

Tested & Reported by: Steve Ness 12-02-09

Approved: Wes Evavold 12-9-09