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Revision 0

Hanford Position Paper on Accuracy and Calibration of 3013 Balance and 9975 Drum Scale

Prepared for the U.S. Department of Energy
Assistant Secretary for Environmental Management

Project Hanford Management Contractor for the
U.S. Department of Energy under Contract DE-AC06-96RL13200

FLUOR[®]

P.O. Box 1000
Richland, Washington

Approved for Public Release;
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Hanford Position Paper

Subject: Accuracy and Calibration of 3013 Balance and 9975 Drum Scale

Requirement Document: NMS-13659, Revision 1, Shipper/Receiver Agreement between the Savannah River Site and the Hanford Site, Section 6.1(c) & (e).

PFPI Implementing Documents: Maintenance Procedure 1-ZM-076, Balances 2736-ZB and 2736-Z Vault (see data sheet 7)
Operations Procedure ZO-300-204, *Load 9975 Shipping Container*
Maintenance Procedure 1-ZM-149, *Calibration of Mettler Toledo^{®1} Drum Scale*

Introduction

Shipping of materials between different locations requires methods for confirming that the correct quantities and materials are shipped and received intact. The quickest method for confirming the correct quantity of material is to weigh the material on a balance. In order for the shipper's and receiver's balances to agree, the balances must use a traceable method of periodic calibration. Once calibrated, the balances must be rechecked periodically with accepted standards to confirm that the balances remain within the allowable tolerances.

This letter affirms that the balances used for weighing 3013 containers and 9975 shipping packages are staying within allowable accepted tolerances and that there is no discernable "drift" in the weighings that might indicate future trouble with the balance.

Weighing of 3013 Container Prior to Placement within 9975 PCV:

Each 3013 is weighed on a Mettler Toledo[®] Model SG16001 balance prior to loading into the primary containment vessel of the 9975 shipping container. The accuracy of this balance is confirmed with weight standards every day that it will be used during loading campaigns in accordance with Calibration Procedure 1-ZM-076. The balance is adjusted per 1-ZM-076, Section 4.2, "Calibration Sequence," if the balance response is outside the tolerance for any of the designated weight standards. The weight standards meet the requirements for National Institute of Standards and Technology (NIST) "S" standards. The tolerances for the weights used are:

500 grams	plus or minus 0.1 grams
1 kilogram	plus or minus 0.2 grams
5 kilograms	plus or minus 1.0 grams
10 kilograms	plus or minus 2.0 grams
15 kilograms	plus or minus 3.0 grams

¹ Mettler Toledo is a registered trademark of Mettler-Toledo, Inc.

The operational 3013 gross weight measurements are recorded on both Data Sheet 1 and Data Sheet 2 of the ZO-300-204 loading procedure. The current range for Hanford 3013 gross weights is between 7.492 kg minimum to 12.397 kg maximum.

A trending review was performed on the calibration data sheets from January 2003 through the present to evaluate tolerance variances over time. The data for the three key weights at 5,000 g, 10,000 g, and 15,000 g were entered into a Microsoft Excel^{®2} spreadsheet. These data were compared to the allowable tolerances to express the difference in indicated weight on the balance with the known weight of the standard weights. The differences were calculated as fractions of the allowable tolerances. The data are listed in Spreadsheet 1. The results are shown graphically in Figure 1.

The data for the three studied weights show that the balance indicated weights outside acceptable tolerances for at least one weight on 6 occasions in the 4+ years of the weight records in the spreadsheet. On each occasion, the calibration section of the procedure was used to put the balance back in calibration. Rechecks of the weights showed that the balance indications went back into the acceptable tolerances every time. The worst departure from the acceptable tolerances was an indication of 4995.4 g for a check weight of 5000.0 g. This difference was 4.6 times the allowable deviation of ± 1 g for that weight, but the deviation is still less than 0.1% of the correct value. Visual examination of Figure 1 shows that the deviations from the exact weights occur upward and downward in an apparently random fashion; thus, there is no discernable "drift" in the balance indications.

Weighing of Loaded 9975 Container:

The gross weight for each loaded Hanford 9975 is performed per PFP Procedure ZO-300-204, *Load 9975 Shipping Package* and the results recorded on both Data Sheet 1 and Data Sheet 4 to that procedure. The measurements are performed in Room 638 of the 2736-ZB building using a Mettler Toledo[®] Model LYNX^{®3} Drum Scale. Calibration of this scale is performed per Calibration Procedure 1-ZM-149, *Calibration of Mettler Toledo[®] Drum Scale System 74D*, using National Institute of Standards and Technology (NIST) check weights with an accuracy of National Standard "S" tolerance. This balance is checked daily prior to use. An extensive effort by Fluor Hanford, including discussions with Mettler Toledo[®], resulted in narrowing the tolerances from ± 0.6 lb to ± 0.2 lb in 2005. The changes in weights checked and the tolerances used are described in Table 1, below.

TABLE 1
METTLER TOLEDO[®] BALANCE CHECK WEIGHTS AND TOLERANCES

Time Period	Weights Checked	Allowed Tolerances
September 2003 through March 2005	0, 200, 400, and 600 pounds	± 0.6 pound at all weights listed
July 2005 through the present	0, 100, 200, 300, 400, and 500 pounds	± 0.2 pound at all weights listed

² Microsoft and Excel are registered trademarks of Microsoft Corporation.

³ LYNX is a registered trademark of Mettler-Toledo, Inc.

Data sheets from September 2003 through the present were reviewed for the same comparisons made on the 3013 balance, as described above. Spreadsheet 2 lists these data for the 200-g, 400-g, and 500-g/600-g weight standards. Figure 2 depicts the data graphically.

The data show that the Mettler Toledo[®] balance was outside the allowable tolerance range only one time and, then, for only one weight standard (600 g). The indicated weight was 599.29 g when the minimum allowable weight indication was 599.40 g. The balance has been within tolerances every time since then, even though the tolerance range was reduced from +/- 0.6 lb. to +/- 0.2 lb. in 2005.

This balance consistently indicated weights that were lower than the actual weights until the balance was recalibrated and checked with tighter tolerances starting in 2005. The few data available since then indicate that the balance indicates slightly higher than the real weights, but more data will be needed for a meaningful study at the new tolerances.

Independent Verification with NIST Standards

A certified technician from Energy Northwest annually tests the weights used for the daily calibration of the drum scale. The weights are tested by direct comparison with standard weights using the drum scale. Appendix 1 is a photocopy of the calibration history of the weights. The 200-lb weights were purchased and first calibrated in 2003. The 100-lb weights were added in 2004.

A Fluor technician attended a training class on August 31 – September 2, 2004 by Mettler Toledo[®] to ensure that the calibration of the drum scale, using the certified weights, was being done in accordance with the latest manufacturer's guidance. The target accuracy for the calibration effort was plus or minus 0.1lb. During previous discussions with the Mettler Toledo[®] representative, our technician inquired as to the ability of the scale to maintain such a tight accuracy band. Mettler Toledo[®] said that although that was possible, a plus or minus 0.2 lb band was what they recommended for these scales.

Conclusion

The balances used to (1) weigh 3013 containers prior to placement in 9975 shipping packages and (2) weigh the loaded and closed 9975 shipping packages consistently stay within tight tolerances. Neither balance indicates a pattern of "drift" that might make it more difficult to maintain within tolerances in the future. More importantly, the PFP Instrument Technicians have demonstrated their ability to return the balances within tolerances whenever either indicates weights outside allowable tolerances, even if the deviation exists at only one check weight. Daily checks (when in use) minimize the number of containers that might need reweighed if a balance slips out of tolerance.

TRENDING ANALYSIS

3013 WEIGHING BALANCE, ROOM 638
METTLER TOLEDO® MODEL SG16001

SERIAL NUMBER 1119291179

Date of Weight Check	"As Found" Indication on balance for 5,000-g weight	Fraction of allowable +/- 1.0 g tolerance	"As Found" Indication on balance for 10,000-g weight	Fraction of allowable +/- 2.0 g tolerance	"As Found" Indication on balance for 15,000-g weight	Fraction of allowable +/- 3.0 g tolerance
1/10/2003	5000.0	0.000	10000.0	0.000	15000.0	0.000
1/13/2003	4999.9	-0.100	9999.9	-0.050	14999.9	-0.033
1/14/2003	5000.1	0.100	10000.0	0.000	15000.0	0.000
1/23/2003	5000.0	0.000	10000.0	0.000	15000.0	0.000
3/4/2003	5000.0	0.000	9999.8	-0.100	14999.8	-0.067
10/16/2003	5000.0	0.000	10000.2	0.100	15000.2	0.067
10/17/2003	5000.0	0.000	10000.1	0.050	15000.1	0.033
10/20/2003	5000.1	0.100	10000.1	0.050	15000.2	0.067
10/21/2003	4999.9	-0.100	10000.0	0.000	15000.0	0.000
10/27/2003	5000.0	0.000	9999.9	-0.050	14999.9	-0.033
10/28/2003	4999.8	-0.200	9999.8	-0.100	14999.8	-0.067
10/29/2003	5000.0	0.000	10000.0	0.000	15000.0	0.000
10/30/2003	4999.9	-0.100	9999.9	-0.050	14999.9	-0.033
11/3/2003	4999.9	-0.100	9999.7	-0.150	14999.7	-0.100
11/11/2003	4999.9	-0.100	9999.7	-0.150	14999.6	-0.133
11/18/2003	5000.0	0.000	10000.0	0.000	15000.0	0.000
11/19/2003	5000.1	0.100	10000.0	0.000	14999.9	-0.033
12/3/2003	4999.9	-0.100	9999.8	-0.100	14999.7	-0.100
12/8/2003	4999.9	-0.100	9999.9	-0.050	14999.8	-0.067
12/9/2003	5000.0	0.000	9999.8	-0.100	14999.7	-0.100
12/10/2003	4999.9	-0.100	9999.9	-0.050	14999.7	-0.100
12/26/2003	4999.9	-0.100	9999.9	-0.050	14999.9	-0.033
1/19/2004	4996.5	-3.500	9996.3	-1.850	14996.2	-1.267
1/20/2004	4999.9	-0.100	9999.7	-0.150	14999.5	-0.167
1/21/2004	4999.7	-0.300	9999.7	-0.150	14999.5	-0.167
3/8/2004	5002.7	2.700	10002.8	1.400	15002.9	0.967
3/30/2004	5000.0	0.000	9999.9	-0.050	14999.8	-0.067
1/22/2004	4999.9	-0.100	9999.7	-0.150	14999.6	-0.133
1/23/2004	4999.8	-0.200	9999.7	-0.150	14999.6	-0.133
1/26/2004	5000.0	0.000	10000.0	0.000	14999.9	-0.033
1/27/2004	5000.0	0.000	9999.9	-0.050	14999.9	-0.033
1/28/2004	5000.0	0.000	9999.9	-0.050	14999.9	-0.033

Date of Weight Check	"As Found" Indication on balance for 5,000-g weight	Fraction of allowable +/- 1.0 g tolerance	"As Found" Indication on balance for 10,000-g weight	Fraction of allowable +/- 2.0 g tolerance	"As Found" Indication on balance for 15,000-g weight	Fraction of allowable +/- 3.0 g tolerance
2/9/2004	5000.0	0.000	10000.0	0.000	15000.1	0.033
2/10/2004	5000.0	0.000	10000.0	0.000	15000.0	0.000
2/11/2004	5000.0	0.000	10000.0	0.000	15000.0	0.000
2/12/2004	5000.0	0.000	9999.9	-0.050	14999.9	-0.033
2/19/2004	5000.2	0.200	10000.2	0.100	15000.3	0.100
2/22/2004	5000.1	0.100	10000.1	0.050	15000.1	0.033
2/23/2004	5000.1	0.100	10000.1	0.050	15000.1	0.033
2/24/2004	5000.1	0.100	10000.2	0.100	15000.2	0.067
2/25/2004	5000.1	0.100	10000.2	0.100	15000.2	0.067
2/29/2004	5000.2	0.200	10000.2	0.100	15000.2	0.067
3/1/2004	5000.7	0.700	10000.8	0.400	15000.9	0.300
3/2/2004	5000.1	0.100	10000.1	0.050	15000.2	0.067
3/3/2004	5000.1	0.100	10000.2	0.100	15000.4	0.133
3/4/2004	5000.1	0.100	10000.2	0.100	15000.3	0.100
3/8/2004	5002.7	2.700	10002.8	1.400	15002.9	0.967
3/9/2004	5000.0	0.000	9999.9	-0.050	15000.0	0.000
3/10/2004	4999.9	-0.100	10000.0	0.000	14999.9	-0.033
3/16/2004	5002.8	2.800	10002.8	1.400	15002.8	0.933
3/22/2004	4999.9	-0.100	9999.9	-0.050	14999.9	-0.033
3/23/2004	4999.9	-0.100	9999.9	-0.050	14999.9	-0.033
3/24/2004	4999.9	-0.100	9999.9	-0.050	14999.9	-0.033
3/25/2004	4999.9	-0.100	9999.9	-0.050	14999.8	-0.067
3/29/2004	4999.9	-0.100	9999.9	-0.050	14999.9	-0.033
3/30/2004	5000.0	0.000	9999.9	-0.050	14999.8	-0.067
5/18/2004	4995.4	-4.600	9995.4	-2.300	14995.2	-1.600
1/17/2007	5000.0	0.000	10000.0	0.000	14999.9	-0.033
2/28/2007	5000.0	0.000	10000.0	0.000	15000.0	0.000
3/26/2007	5000.0	0.000	10000.0	0.000	15000.1	0.033
5/2/2007	5000.0	0.000	9999.9	-0.050	15000.0	0.000
6/7/2007	5000.0	0.000	10000.0	0.000	15000.0	0.000

Figure 1

3013 BALANCE CALIBRATION CHECKS

TRENDING ANALYSIS

DRUM WEIGHING BALANCE, ROOM 638
METTLER TOLEDO® MODEL LYNX®

SERIAL NUMBER 5339656-5BE

Date of Weight Check	"As Found" Indication on balance for 200-lb weight(s)	Fraction of allowable +/- 0.6 lb. tolerance	"As Found" Indication on balance for 400-lb weight(s)	Fraction of allowable +/- 0.6 lb. tolerance	"As Found" Indication on balance for 600-lb weight(s)	Fraction of allowable +/- 0.6 lb. tolerance
9/5/2003	199.81	-0.317	399.82	-0.300	599.73	-0.450
9/9/2003	199.74	-0.433	399.80	-0.333	599.75	-0.417
9/10/2003	199.76	-0.400	399.83	-0.283	599.77	-0.383
9/11/2003	199.70	-0.500	399.69	-0.517	599.61	-0.650
9/24/2003	199.78	-0.367	399.88	-0.200	599.90	-0.167
9/25/2003	199.72	-0.467	399.72	-0.467	599.63	-0.617
9/29/2003	199.74	-0.433	399.74	-0.433	599.66	-0.567
9/30/2003	199.70	-0.500	399.67	-0.550	599.61	-0.650
10/6/2003	199.71	-0.483	399.71	-0.483	599.61	-0.650
10/8/2003	199.70	-0.500	399.70	-0.500	599.63	-0.617
10/13/2003	199.80	-0.333	399.71	-0.483	599.78	-0.367
10/14/2003	199.78	-0.367	399.84	-0.267	599.80	-0.333
10/16/2003	199.66	-0.567	399.61	-0.650	599.52	-0.800
10/17/2003	199.72	-0.467	399.72	-0.467	599.62	-0.633
10/20/2003	199.81	-0.317	399.92	-0.133	599.95	-0.083
10/21/2003	199.78	-0.367	399.88	-0.200	599.86	-0.233
10/28/2003	199.73	-0.450	399.73	-0.450	599.66	-0.567
10/29/2003	199.72	-0.467	399.70	-0.500	599.76	-0.400
10/30/2003	199.78	-0.367	399.82	-0.300	599.78	-0.367
11/3/2003	199.77	-0.383	399.80	-0.333	599.74	-0.433
11/11/2003	199.83	-0.283	399.80	-0.333	599.70	-0.500
12/3/2003	199.70	-0.500	399.64	-0.600	599.51	-0.817
12/8/2003	199.72	-0.467	399.70	-0.500	599.61	-0.650
12/9/2003	199.70	-0.500	399.64	-0.600	599.52	-0.800
12/10/2003	199.69	-0.517	399.64	-0.600	599.54	-0.767
12/15/2003	199.66	-0.567	399.59	-0.683	599.46	-0.900
1/19/2004	199.69	-0.517	399.64	-0.600	599.50	-0.833
1/20/2004	199.78	-0.367	399.83	-0.283	599.78	-0.367
1/21/2004	199.79	-0.350	399.84	-0.267	599.82	-0.300
1/22/2004	199.77	-0.383	399.79	-0.350	599.74	-0.433

Date of Weight Check	"As Found" Indication on balance for 200-lb weight(s)	Fraction of allowable +/- 0.6 lb. tolerance	"As Found" Indication on balance for 400-lb weight(s)	Fraction of allowable +/- 0.6 lb. tolerance	"As Found" Indication on balance for 600-lb weight(s)	Fraction of allowable +/- 0.6 lb. tolerance
1/23/2004	199.77	-0.383	399.79	-0.350	599.73	-0.450
1/26/2004	199.79	-0.350	399.81	-0.317	599.79	-0.350
2/9/2004	199.91	-0.150	400.05	0.083	600.05	0.083
2/10/2004	199.76	-0.400	399.79	-0.350	599.74	-0.433
2/11/2004	199.82	-0.300	399.93	-0.117	599.96	-0.067
2/12/2004	199.69	-0.517	399.66	-0.567	599.52	-0.800
2/18/2004	199.72	-0.467	399.68	-0.533	599.55	-0.750
2/19/2004	199.76	-0.400	399.80	-0.333	599.73	-0.450
2/22/2004	199.74	-0.433	399.72	-0.467	599.64	-0.600
2/23/2004	199.67	-0.550	399.62	-0.633	599.49	-0.850
2/24/2004	199.77	-0.383	399.82	-0.300	599.77	-0.383
2/25/2004	199.64	-0.600	399.50	-0.833	599.29	-1.183
2/26/2004	199.71	-0.483	399.70	-0.500	599.58	-0.700
2/29/2004	199.65	-0.583	399.53	-0.783	599.68	-0.533
3/2/2004	199.72	-0.467	399.63	-0.617	599.42	-0.967
3/3/2004	199.71	-0.483	399.69	-0.517	599.62	-0.633
3/4/2004	199.70	-0.500	399.67	-0.550	599.53	-0.783
3/8/2004	199.66	-0.567	399.60	-0.667	599.44	-0.933
3/9/2004	199.74	-0.433	399.74	-0.433	599.64	-0.600
3/10/2004	199.75	-0.417	399.68	-0.533	599.51	-0.817
3/22/2004	199.68	-0.533	399.62	-0.633	599.45	-0.917
3/23/2004	199.72	-0.467	399.71	-0.483	599.61	-0.650
3/24/2004	199.69	-0.517	399.62	-0.633	599.47	-0.883
3/25/2004	199.68	-0.533	399.61	-0.650	599.50	-0.833
3/29/2004	199.67	-0.550	399.60	-0.667	599.43	-0.950
3/30/2004	199.66	-0.567	399.61	-0.650	599.46	-0.900
6/16/2004	200.0	0.000	400.0	0.000		
7/6/2004	200.0	0.000	400.0	0.000		
7/8/2004	200.0	0.000	400.0	0.000		
7/15/2004	200.0	0.000	400.0	0.000		
8/16/2004	200.0	0.000	400.0	0.000		
8/17/2004	200.0	0.000	400.0	0.000		
8/17/2004	200.0	0.000	400.0	0.000		

Date of Weight Check	"As Found" Indication on balance for 200-lb weight(s)	Fraction of allowable +/- 0.6 lb. tolerance	"As Found" Indication on balance for 400-lb weight(s)	Fraction of allowable +/- 0.6 lb. tolerance	"As Found" Indication on balance for 600-lb weight(s)	Fraction of allowable +/- 0.6 lb. tolerance
8/20/2004	200.0	0.000	400.0	0.000		
3/8/2005	199.98	-0.033	399.99	-0.017	500.03	0.150
7/8/2005	199.99	-0.017	400.01	0.017	500.05	0.250
9/20/2005	199.99	-0.017	400.06	0.100	500.02	0.100
3/20/2006	200.00	0.000	400.02	0.033	500.00	0.000
9/11/2006	200.00	0.000	400.02	0.033	500.02	0.100
3/7/2007	200.07	0.117	400.10	0.167	500.11	0.550
6/5/2007	200.03	0.050	400.07	0.117	500.04	0.200

Changed maximum weight to 500 lb; changed tolerance to +/- 0.2 lb.

Figure 2

HNF-34155, Rev. 0

Page A-1

Appendix 1

Calibration History of Weights

HNF-34155, Rev. 0

Page A-2

Standards Laboratory

Plant Support Facility
MD 1025, PO Box 968
Richland, WA 99352-0968

Phone (509) 377-8603 FAX (509) 377-8219

Set 3 200lb

Weights
Set System
in CP under
11W010Z
LAB number

Certificate of Calibration

Manufacturer: RICE LAKE
Description: WEIGHT AVOIRDUPOIS
Report Number: 1061568145
Release Number:
Customer / MSIN: GARRISON SM / T5-02

Model: N/A
Asset Number: 840-86-01-006
Serial Number: 11W010Z/11W011Z/11W012Z
Ref. Number: 03-00559
Building: 234-5

CALIBRATION INFORMATION

Test Conditions:

Receive Date: 17-Mar-03
Calibration Date: 22-Aug-03
Calibration Due: 22-Aug-04
Technician: W. E. CALLAWAY

Procedure / Rev: 30-2 Rev. 4
Temperature: 25.0 C
Humidity: 0 %

Test Results:

Pass: Y
Incomplete: N
Limited: N
As Found: PASS
As Left: PASS

Remarks: CALIBRATED IN-PLACE (3) 200 LB. WEIGHTS.

STANDARDS USED FOR CALIBRATION

Asset Number	Manufacturer	Model	Description	Calibration Date	Due Date
002-79-06-003	SOAR	TX-201C	THERMOMETER	1/20/2003	1/20/2004
003-86-01-003	HOWE	HOWE	WEIGHT AVOIR	10/24/2001	10/24/2003

Notes/General Conditions:

The standards and calibration program of the Energy Northwest Standards Laboratory complies with the requirements of 10 CFR50 Appendix B and ANSI/NCSL Z-540-1.

Unless otherwise noted:

The standards used in this calibration, described in the referenced calibration procedure with associated uncertainties or tolerances, are traceable to the National Institute of Standards and Technology (NIST). The total uncertainties or tolerances of the standards used are no greater than 25% of the tolerance of the unit tested. There are no special limitations of use imposed on this item. This Report may not be reproduced, except in full, without the permission of the Energy Northwest Standards Laboratory.

Maye Chaney
Manager, Standards Laboratory

8-22-03
Date

ORIGINAL

HNF-34155, Rev. 0

Page A-3

ENERGY NORTHWEST		STANDARDS LABORATORY		CUSTOMER: CAROLYN EPPS / T5-02 234-5 TOOLCRIB	
REPORT OF CALIBRATION					
MANUFACTURER: RICE LAKE		MODEL: 200 LBS.		NOMENCLATURE: WEIGHT SET	
S/N: 11W010Z/11W011Z/11W012Z		CAL CODE OR ID #: 840-86-01-006		AMBIENT TEMP: 25°C	
				HUMIDITY: N/A%	
CAL DATE: 08-22-03		DUE DATE: 08-22-04		AS FOUND: IN	
				AS LEFT: IN	
				PROCEDURE: SLI 30-2	
				REV: 4	
STANDARDS USED:					
MANUFACTURER:		MODEL:		CAL. CODE OR ID #:	
SOAR		TX-201C		002-79-06-003	
HOWE		50 LBS.		003-86-01-003	
REMARKS:					
MASS CALIBRATED BY DIRECT COMPARISON WEIGHING.					
CALIBRATION DATA					
NOMINAL VALUE	AS FOUND APPARENT MASS 8.0	EXPANDED UNCERTAINTY	TOLERANCE CLASS: N/A		
199.99 LBS.	S/N. 11W010Z / 199.99 LBS.	.03 LBS.	AS FOUND		
"	S/N. 11W011Z / 199.99 LBS.	"	"		
"	S/N. 11W012Z / 199.99 LBS.	"	"		
REVIEWED BY	DATE	TESTED BY	DATE		
<i>John B. [Signature]</i>	8-22-03	<i>W.E. Callaway</i>	08-22-03		

CALFORM1999

ORIGINAL

Page 3 of 4

HNF-34155, Rev. 0

63-00559

840-86-01-006

Page A-4

199.86
199.82
199.82
199.82
199.82
199.81
199.79
199.83
199.83
199.82

0.017512

.03 @ 95% confidence interval

Page 3 of 4

ORIGINAL

HNF-34155, Rev. 0.

Page A-5

Standards Laboratory Calibration Certificate

Kootenai Bldg 34
MD 1025, PO Box 968
Richland, WA 99352-0968
Phone (509) 377-8444 FAX (509) 377-8219

ASSET INFORMATION

Manufacturer: RICE LAKE Model: N/A
Description: WEIGHT AVOIRDUPOIS - 5 EACH Asset Number: 840-86-01-006
Report Number: 1093011285 Serial Number: See Page 2.
Release Number: Ref/PO Number: 04-01715
Customer / MD: *Abramson D WIPP / T4-20* Building: 234-5
ABRAMSON D T4-20 11-29-04

CALIBRATION INFORMATION

Test Conditions:

Receive Date	Calibration Date	Due Date	Temperature	Humidity	Procedure / Revision	Calibration Specification
18-Aug-04	20-Aug-04	20-Aug-05	77 F	0 %	30-2 / 4	Customer

Test Results:

Pass	Limited	AS FOUND	AS LEFT	Technician	Remarks
Y	N	In-Tolerance	In-Tolerance	WE Callaway	See Attached Report w/ Remarks

Standards Used for Calibration:

Asset Number	Manufacturer	Model	Description	Calibration Date	Due Date
002-79-06-003	SOAR	TX-201C	THERMOMETER	2/5/2004	2/5/2005
003-86-01-003	HOWE	HOWE	WEIGHT AVOIR	11/4/2003	11/4/2005

CORRECTED COPY

*Corrected Custodian Designation
on Aug 1 + 3 Per Customer request.
11-29-04*

FILE COPY

Notes/General Conditions:

The standards and calibration program of the Energy Northwest Standards Laboratory complies with the requirements of 10 CFR50 Appendix B and ANSI/NCSL Z-540-1-1994.

The standards used in this calibration as described above, and their associated uncertainties or tolerances, are traceable to the National Institute of Standards and Technology (NIST) or nationally accepted intrinsic standards. The total uncertainties or tolerances of the standards used are no greater than 25% of the tolerance of the unit tested, unless otherwise noted. This Report may not be reproduced, except in full, without the permission of the Energy Northwest Standards Laboratory.

[Signature]
Standards Laboratory Representative

10/20/04
Date

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Page 1 of 5

HNF-34155, Rev.0 Page R-6 04-27-15

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REPORT OF CALIBRATION

MANUFACTURER: RICE LAKE		MODEL: 200/100 LBS.	TECHNICIAN: WE CALLAWAY <i>WCC</i>	
S/N: 11W010Z/11W011Z/11W012Z/11W035Z/11W036Z		CAL CODE OR ID #: 840-86-01-006		AMBIENT TEMP: 25°C HUMIDITY: N/A
CAL DATE: 08-20-04	AS FOUND: PASS	PROCEDURE: SLI 30-2		REV: 4

REMARKS:

MASS CALIBRATED USING DIFFERENTIAL WEIGHING

CALIBRATION DATA

NOMINAL VALUE	AS FOUND APPARENT MASS 8.0	EXPANDED UNCERTAINTY	TOLERANCE CLASS: N/A
200.000 LBS.	S/N. 11W010Z / 200.01 LBS.	.03 LBS.	AS FOUND
"	S/N. 11W011Z / 200.04 LBS.	"	"
"	S/N. 11W012Z / 200.01 LBS.	"	"
100.000 LBS.	S/N. 11W035Z / 100.01 LBS.	"	"
"	S/N. 11W036Z / 100.01 LBS.	"	"

CALFORM1999

ORIGINAL

Page 2 of 5

HNF-34155, Rev. 0

Page 1 of 1

Page A-7

Quinn, Karen L

From: DeRosa, David C
Sent: Tuesday, September 20, 2005 10:31 AM
To: McCollum, C R (Rick); Quinn, Karen L; Schumacher, Ronald F; Huggins, Stewart L
Cc: Abramson, Debi; 'jremery@energy-northwest.com'; Oliver, F Ben; Sutter, Caroline S; Peale, Debra D; Sutherland, Aprilly S; Franklin, Laurie D; Woodruff-Shaw, Janice L
Subject: RE: weight set 840-86-01-006

I approve -

David DeRosa

From: McCollum, C R (Rick)
Sent: Tuesday, September 20, 2005 10:26 AM
To: Quinn, Karen L; Schumacher, Ronald F; DeRosa, David C; Huggins, Stewart L
Cc: Abramson, Debi; 'jremery@energy-northwest.com'; Oliver, F Ben; Sutter, Caroline S; Peale, Debra D; Sutherland, Aprilly S; Franklin, Laurie D; Woodruff-Shaw, Janice L
Subject: RE: weight set 840-86-01-006

Karen, Changes in interval on WIPP related equipment also require approval of Dave Derosa, the WIPP Site Project Manager, and Stu Huggins, the WIPP Site Quality Assurance Officer. I am forwarding this email to them to receive that approval. When the weights are recalibrated, the calibration interval should be adjusted to five years, based on the use of the weights as check weights with an expanded uncertainty of 0.03 lbs. to check a Fairbanks scale with an accuracy of +/-10 lbs., and their cast iron construction with tight controls on care and handling. Please work with Caroline Sutter to transmit the calibration certificates to WIPP records and I'll add the weights to the WIPP Calibrated Equipment List. Call me if you have other questions.

Rick McCollum
376-8989
845-2101

From: Quinn, Karen L
Sent: Tuesday, September 20, 2005 8:32 AM
To: Schumacher, Ronald F
Cc: Abramson, Debi; 'jremery@energy-northwest.com'; Oliver, F Ben; Sutter, Caroline S; Peale, Debra D; Sutherland, Aprilly S; Franklin, Laurie D; Quinn, Karen L; Woodruff-Shaw, Janice L; McCollum, C R (Rick)
Subject: weight set 840-86-01-006

The weight set 840-86-01-006 expired on Aug.20, 2005 we are needing an extension and justification of its calibration certificate till Oct 20, 2005 this is \$50.00. We then will have Energy Northwest come out and do a recalibration before this time expires.
Ron please forward this to Jim Emery at Energy Northwest with your concurrence that this is satisfactory, I'm faxing the order number down to energy northwest.

Thank you
Karen Quinn
PFP Tool Crib
373-4648

9/20/2005

Routine Calibration Services - Order # 03-00559 HNF-34155, Rev. 0

Page 1 of 1 Page A-8

Routine Calibration ServicesOrder # 03-00559
Order Date 03/16/200310W010Z
10W011Z
10W012Z
Set.**Equipment Information:**SCN: 111-11-11-111 840-86-01-004
Manufacturer: NEW EQUIPMENT
Model: NEW EQUIPMENT
Serial Number: NEW EQUIPMENT
Description: NEW EQUIPMENT.
Calibration Range & Tolerance and Special Calibration Instructions:
ENTER MFG, MDL NO., S/N, DESC, AND CAL RANGE AND TOLERANCE Rice
lakes, Weight Set, 200lbs EA. Calibrate to manufacturer specification. IN House
total 600lbs. 3 weights. Will call for date.**Quality/Inspection Information:**Quality Level: 1
Safety Classification: SC
QAE: Groth Don
QAE Phone: 509-373-5029
Approved QAIP on File w/ AVS? Yes
CACN: 116486
COA: AF20
Designated Equipment: NONEIn House Calibration
Will call for
date to be done.**Cost Information:**Expedite: No
Requested Return Date: n/a
Unit Price: 400.00
Task Order Price: 400.00Scale will be
done at same time
on separate contract.**Equipment Custodian:**P-Card Log Number: h0065674-6289
Custodian: Epps Carolyn
Phone: 509-373-4648
MSIN: T5-02
Deliver To:
234-5 toolcrib

NO part sent

Return

(3-17-03) - originally logged in
8-21-03

Page 4 of 4

HNF-34155, Rev. 0

Page A-9

Standards Laboratory Calibration Certificate

Kootenai Bldg 34
MD 1025, PO Box 968
Richland, WA 99352-0968
Phone (509) 377-8444 FAX (509) 377-8219

ASSET INFORMATION

Manufacturer: RICE LAKE Model: N/A
Description: WEIGHT AVOIRDUPOIS - 5 EACH Asset Number: 840-86-01-006
Report Number: 1093011285 Serial Number: See Page 2.
Release Number: Ref/PO Number: 04-01715-05-01919 ^{LS} 92065
Customer / MD: ABRAMSON D WIPP / T420 ^{LS} 112924 Building: 234-5

CALIBRATION INFORMATION

Test Conditions:

Receive Date	Calibration Date	Due Date	Temperature	Humidity	Procedure / Revision	Calibration Specification
18-Aug-04	20-Aug-04	20-Aug-05	77 F	0 %	30-2 / 4	Customer

Test Results:

Pass	Limited	AS POUND	AS LEFT	Technician	Remarks
Y	N	In-Tolerance	In-Tolerance	WE Callaway	See Attached Report w/ Remarks

Standards Used for Calibration:

Asset Number	Manufacturer	Model	Description	Calibration Date	Due Date
002-79-06-003	SOAR	TX-201C	THERMOMETER	2/5/2004	2/5/2005
003-86-01-003	HOWE	HOWE	WEIGHT AVOIR	11/4/2003	11/4/2005

CORRECTED COPY

Corrected Custodian Designation
on Pgs 1 + 3 Per Customer request.
^{LS} 11-29-04

THE REVIEW OF THE CALIBRATION HISTORY SHOWS THESE WEIGHTS ARE STABLE.
A CALIBRATION EXTENSION OF TWO (2) MONTHS IS GRANTED IN ORDER
FOR USER TO MEET CURRENT WORK IN PROGRESS.

RE: Enamny 09/20/2005

Notes/General Conditions:

The standards and calibration program of the Energy Northwest Standards Laboratory complies with the requirements of 10 CFR50 Appendix B and ANSI/NCSL Z-540-1-1994.

The standards used in this calibration as described above, and their associated uncertainties or tolerances, are traceable to the National Institute of Standards and Technology (NIST) or nationally accepted intrinsic standards. The total uncertainties or tolerances of the standards used are no greater than 25% of the tolerance of the unit tested, unless otherwise noted. This Report may not be reproduced, except in full, without the permission of the Energy Northwest Standards Laboratory.

Standards Laboratory Representative

Date

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Page 1 of 5

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HNF-34155, Rev. 0

Page A-10

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REPORT OF CALIBRATION

MANUFACTURER: RICE LAKE		MODEL: 200/100 LBS.	TECHNICIAN: WE CALLAWAY <i>wcc</i>	
S/N: 11W010Z/11W011Z/11W012Z/11W035Z/11W036Z		CAL CODE OR ID #: 840-86-01-006	AMBIENT TEMP: 25°C	HUMIDITY: N/A
CAL DATE: 08-20-04	AS FOUND: PASS	PROCEDURE: SLI 30-2	REV: 4	

REMARKS:

MASS CALIBRATED USING DIFFERENTIAL WEIGHING

CALIBRATION DATA

NOMINAL VALUE	AS FOUND APPARENT MASS 8.0	EXPANDED UNCERTAINTY	TOLERANCE CLASS: N/A
200.000 LBS.	S/N. 11W010Z / 200.01 LBS.	.03 LBS.	AS FOUND
"	S/N. 11W011Z / 200.04 LBS.	"	"
"	S/N. 11W012Z / 200.01 LBS.	"	"
100.000 LBS.	S/N. 11W035Z / 100.01 LBS.	"	"
"	S/N. 11W036Z / 100.01 LBS.	"	"

CALFORM1999

ORIGINAL

Page 2 of 5

ORIGINAL

HNF-34155, Rev 0

Page A-11-11

Routine Calibration ServicesOrder # 04-01715
Order Date 08/19/2004**Equipment Information:**

SCN: 840-86-01-006
 Manufacturer: RICE LAKE
 Model: N/A
 Serial Number: 11W010Z/11W011Z
 Description: WEIGHT AVOIRDUPOIS
 Calibration Range & Tolerance and Special Calibration Instructions:
 CALIBRATED IN-PLACE (3) 200 LB. WEIGHTS. Add (2) 100 LB. WEIGHTS TO
 SET. CALIBRATE 200 lb. WEIGHTS TO LAST REPORT. CALIBRATE 100 LB.
 WEIGHTS TO 100 LBS.

Quality/Inspection Information:

Quality Level: 1
 Safety Classification: SC
 QAE: Don Groth
 QAE Phone: 509-373-5029
 Approved QAIP on File w/ AVS? Yes
 CACN: 119262
 COA: FA30
 Designated Equipment: ~~NONE~~ WIPP ^{LS} 11-29-04

Cost Information:

Expedite: Yes 2.0 for next on bench (24 hour)
 Requested Return Date: 8/19/04
 Unit Price: 371 Add \$100.00 for Trip.
 Task Order Price: 742

Equipment Custodian:

P-Card Log Number: H0065674-8146
 Custodian: ~~Garter, Mark~~ Abramson D WIPP/T4-20
 Phone: 509-373-4848 ^{LS} 11-29-04
 MSIN: T5-02
 Deliver To:
 In House

Return

8-18-04

SHT info from Bill

11W010Z 11W035Z

11W011Z 11W036Z

11W012Z

In-Place

Set of 5 (3) 200 lbs sn's -
 (2) 100 lbs sn's -

ORIGINAL

ORIGINAL

Calibration Services - Order # 05-01592

HNF-34155, Rev. 0

Page 1 of 1

Page A-12

Routine Calibration Services

Order # 05-01592
Order Date 07/25/2005

Equipment Information:

SCN: 840-86-01-006
Manufacturer: RICE LAKE
Model: N/A
Serial Number: See Page 2.
Description: WEIGHT AVOIRDUPOIS - 5 EACH
Calibration Range & Tolerance and Special Calibration Instructions:

Quality/Inspection Information:

Quality Level: 1
Safety Classification: SC
QAE: Groth, Don
QAE Phone: 509-373-5029
Approved QAIP on File w/ AVS? Yes
CACN: 119282
COA: KA10
Designated Equipment: ~~NONE~~ WIPP 7/25/05

Cost Information:

Expedite: No
Requested Return Date: n/a
Unit Price: 370
Task Order Price: 370 \$50⁰⁰ calibration extension

Equipment Custodian:

P-Card Log Number: h0065674-9880
Custodian: Abramson, Debi
Phone: 509-373-5508
MSIN: T5-02
Deliver To:
PFP Tool Crib
373-4648

Return

Rm 638

Building 2736-ZB

HNF-34155, Rev. 0.

Page A-13

Standards Laboratory Calibration Certificate

Kootenai Bldg 34
MD 1025, PO Box 968
Richland, WA 99352-0968
Phone (509) 377-8444 FAX (509) 377-8219

ASSET INFORMATION

Manufacturer: RICE LAKE **Model:** N/A
Description: WEIGHT AVOIRDUPOIS - 5 EACH **Asset Number:** 840-86-01-006
Report Number: 1129648369 **Serial Number:** N/A
Release Number: **Ref/PO Number:** 05-01592 05-02145 10-1425
Customer / MD: ABRAMSON D WIPP / T4-20 **Building:** 234-5

CALIBRATION INFORMATION

Test Conditions:

Receive Date	Calibration Date	Due Date	Temperature	Humidity	Procedure / Revision	Calibration Specification
25-Jul-05	18-Oct-05	18-Oct-06	24 C	N/A	30-2 / 4	Customer

Test Results:

Pass	Limited	AS FOUND	AS LEFT	Technician	Remarks
Y	N	In-Tolerance	In-Tolerance	WE Callaway	See Attached Report w/ Remarks

Standards Used for Calibration:

Asset Number	Manufacturer	Model	Description	Calibration Date	Due Date
002-79-06-003	SOAR	TX-201C	THERMOMETER	2/18/2005	2/18/2006
003-86-01-003	HOWE	HOWE	WEIGHT AVOIR	11/4/2003	11/4/2005

Notes/General Conditions:

The standards and calibration program of the Energy Northwest Standards Laboratory complies with the requirements of 10 CFR50 Appendix B, ASME NQA-1 (1989), and ANSI/NCSS Z-540-1-1994.

The standards used in this calibration as described above, and their associated uncertainties or tolerances, are traceable to the National Institute of Standards and Technology (NIST) or nationally accepted intrinsic standards. The total uncertainties or tolerances of the standards used are no greater than 25% of the tolerance of the unit tested, unless otherwise noted. This Report may not be reproduced, except in full, without the permission of the Energy Northwest Standards Laboratory.

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Standards Laboratory Representative

Date

10-18-05

Page 1 of 3

HNF-34155, Rev. 0

Page A-14
05-02145

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REPORT OF CALIBRATION

MANUFACTURER: RICE LAKE		MODEL: 200/100LBS.		NOMENCLATURE: WEIGHT SET	
S/N: barcode #s: 11W010Z/11W011Z/11W012Z/11W035Z/11W036Z		CAL CODE OR ID #: 840-86-01-006		AMBIENT TEMP: 24°C	
HUMIDITY: N/A		CAL DATE: 10-18-05		AS FOUND: PASS	
TECHNICIAN: WE CALLAWAY <i>WEC</i>		PROCEDURE: SLI 30-2		REV: 4	

REMARKS:

MASS CALIBRATED USING DIFFERENTIAL WEIGHING

CALIBRATION DATA

NOMINAL VALUE	AS FOUND APPARENT MASS 8.0	EXPANDED UNCERTAINTY	TOLERANCE CLASS: N/A
200.000 LBS.	S/N. 11W010Z / 200.01 LBS.	.03 LBS.	AS FOUND
"	S/N. 11W011Z / 200.01 LBS.	"	"
"	S/N. 11W012Z / 200.00 LBS.	"	"
100.000 LBS.	S/N. 11W035Z / 100.00 LBS.	"	"
"	S/N. 11W036Z / 100.00 LBS.	"	"

CALFORM1999

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HNF-34155, Rev. 0

Page A-15

Page 1 of 1

Routine Calibration ServicesOrder # 05-02145
Order Date 10/17/2005(3) 200 lbs.
(2) 100 lbs.**Equipment Information:**SCN: 840-86-01-006
Manufacturer: RICE LAKE
Model: N/A
Serial Number: N/A
Description: WEIGHT AVOIRDUPOIS - 5 EACH
Calibration Range & Tolerance and Special Calibration Instructions:
~~TWO MONTH EXTENSION PER JR EMERY 9-20-05.~~ LS 101805**Quality/Inspection Information:**Quality Level: 1
Safety Classification: SC
QAE: Don Groth
QAE Phone: 509-373-5029
Approved QAIP on File w/ AVS? Yes
CACN: 119282
COA: KA10
Designated Equipment: NONE**Cost Information:**Expedite: No
Requested Return Date: n/a
Unit Price: 394
Task Order Price: 394 + 100 Travel**Equipment Custodian:**P-Card Log Number: h0065674-1169
Custodian: Debi Abramson
Phone: 509-373-5508
MSIN: T4-20
Deliver To:
PFP Tool Crib
373-4648

Return

101805

ORIGINAL

Page 3 of 3

Standards Laboratory Calibration Certificate

NWF-34155, Rev 2 Kootenai Bldg 34 *Page A-16*
MD 1025, PO Box 968
Richland, WA 99352-0968
Phone (509) 377-8444 FAX (509) 377-8219

ASSET INFORMATION

Manufacturer:	RICE LAKE	Model:	N/A
Description:	WEIGHT AVOIRDUPOIS - 1	Asset Number:	840-86-01-006
Report Number:	1173098852	Serial Number:	N/A
Release Number:		Ref/PO Number:	07-00386
Customer / MD:	RANDELL RM WIPP / T5-50	Building:	234-5

CALIBRATION INFORMATION

Test Conditions:

Receive Date	Calibration Date	Due Date	Temperature	Humidity	Procedure / Revision	Calibration Specification
3/5/2007	5-Mar-07	5-Mar-08	20 C	N/A	30-2 / 4	Customer

Test Results:

Pass	Limited	AS FOUND	AS LEFT	Technician	Remarks
Y	N	In-Tolerance	In-Tolerance	GB Ohler <i>SS</i>	See Attached Report w/ Remarks

Standards Used for Calibration:

Asset Number	Manufacturer	Model	Description	Cal. Date	Due Date
0064274	WAHL	700MC	THERMOMETER, HEAT PROBER	12/11/2006	12/11/2007
003-86-01-006	RICE LAKE	NA	WEIGHT AVOIRDUPOIS	11/9/2005	11/9/2007

Notes/General Conditions:

The standards and calibration program of the Energy Northwest Standards Laboratory complies with the requirements of 10 CFR50 Appendix B, ASME NQA-1 (1989), and ANSI/NC SL Z-540-1-1994.

The standards used in this calibration as described above, and their associated uncertainties or tolerances, are traceable to the National Institute of Standards and Technology (NIST) or nationally accepted intrinsic standards. The total uncertainties or tolerances of the standards used are no greater than 25% of the tolerance of the unit tested, unless otherwise noted. This Report may not be reproduced, except in full, without the permission of the Energy Northwest Standards Laboratory.

MP 3-5-07
Standards Laboratory Representative Date

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HNF-34155, Rev. 0

01-00006

Standards Laboratory

Page A-17

Calibration Report

Manufacturer RICE LAKE	Model N/A	Cal Code 840-86-01-006	Serial No. N/A
Condition: FOUND-LEFT	Cal Date: 3/5/2007	Performed by: GB Ohler	
Remarks: See Comments Below			

STANDARD PARAMETER	TRUE VALUE	LOWER LIMIT	UUT INDICATION	UPPER LIMIT	ERROR (in% of Tol)	NOTIFY TUR USER
RESULTS:						
Result of Operator Evaluation						Pass
This Instrument PASSED all applicable tests.						

COMMENTS:

Reported Actual Mass Value
Mass Calibrated By Differential Weighing

END OF TEST DATA

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Calibration Report

Page A-18

Manufacturer: Rice Lake	Cal Code: 840-86-01-006		Serial Number: N/A	
Cal Date: 5 Mar 07	Model: 200 lbs / 100 lbs	Performed by: GB Ohler	Procedure: SLI 30-2	Rev: 4

Remarks: **Mass Calibrated By Differential Weighing**

[illegible]

ORIGINAL

HNF-34155, Rev. 0

Page A-19

Routine Calibration Services - Order # 07-00386

Page 1 of 1

Routine Calibration ServicesOrder # 07-00386
Order Date 02/28/2007**Equipment Information:**

SCN: 840-86-01-006
Manufacturer: RICE LAKE
Model: N/A
Serial Number: N/A
Description: WEIGHT AVOIRDUPOIS - 5 EACH
Calibration Range & Tolerance and Special Calibration Instructions:
3-200lbs and 2-100lbs. Certify to assigned specifications IN-HOUSE Calibration
\$100.00

Quality/Inspection Information:

Quality Level: 1
Safety Classification: SC
QAE: Don Groth
QAE Phone: 509-373-5209
Approved QAIP on File w/ AVS? Yes
CACN: 119282
COA: KA10
Designated Equipment: WIPP

Cost Information:

Expedite: No
Requested Return Date: n/a
Unit Price: 524
Task Order Price: $524 \times 1.6 + 107.00 = 985.40$
mfe 3-5-07

Equipment Custodian:

P-Card Log Number: h0065674-2767
Custodian: Rick Ransdell
Phone: 509-373-5036
MSIN: T5-50
Deliver To:
234-5Z 200W Tool Crib 373-4648

Return

3507

ORIGINAL

Page 5 of 5