



## Department of Energy

Washington, DC 20585

QA: QA

JUN 05 2002

T. W. Doering  
Bechtel SAIC Company, LLC  
1180 Town Center Drive, M/S 423  
Las Vegas, NV 89144

VERIFICATION OF CORRECTIVE ACTION AND CLOSURE OF DEFICIENCY REPORT  
(DR) BSC-02-D-076 RESULTING FROM THE OFFICE OF QUALITY ASSURANCE (OQA)  
SURVEILLANCE BSC-02-S-09

The OQA staff has evaluated the corrective action of DR BSC-02-D-076 and determined the result to be satisfactory. As a result, the DR is considered closed.

If you have any questions, please contact either James Blaylock at (702) 794-1420 or Patrick V. Auer at (702) 794-1353.

OQA:JB-1254

Enclosure:  
DR BSC-02-D-076

*James Blaylock*  
Ram B. Murthy, Acting Director  
Office of Quality Assurance



JUN 05 2002

cc w/encl:

N. K. Stablein, NRC, Rockville, MD  
Robert Latta, NRC, Las Vegas, NV  
S. W. Lynch, State of Nevada, Carson City, NV  
Engelbrecht von Tiesenhausen, Clark County, Las Vegas, NV  
Cliff Howard, BSC/SNL, Las Vegas, NV  
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NM5507  
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**OFFICE OF CIVILIAN  
RADIOACTIVE WASTE MANAGEMENT  
U.S. DEPARTMENT OF ENERGY  
WASHINGTON, D.C.**

8.  DEFICIENCY REPORT  
 CORRECTIVE ACTION REPORT  
**THIS IS A RED STAMP**  
 NO. BSC-02-D-076  
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**DEFICIENCY/CORRECTIVE ACTION REPORT**

1. Controlling Document:  
 AP-12.1, Revision 0, ICN 2, *Control of Measuring and Test Equipment and Calibration Standards*

2. Related Report No.:  
 BSC-02-S-09

3. Responsible Organization:  
 Bechtel SAIC Company, LLC (BSC), URS Group, Inc.,  
 Santa Ana, California

4. Discussed With:  
 Cliff Howard, Michael Luebbers

5. Requirement:  
 AP-12.1Q, Section 5.3.1.6 states: Ensure that calibration documentation includes the following:
- The unique identification of the M&TE calibrated
  - Date calibrated
  - Calibration data
  - Recalibration due date or calibration interval/frequency
  - Procedure (including revision level) used to calibrate the M&TE
  - Identification of and traceability to the calibration standards used for the calibration
  - Results of the calibration and statement of acceptability
  - As-found condition of the M&TE, as appropriate
  - Specified range and tolerances and whether the M&TE met those tolerances
  - Personnel performing calibrations.

6. Description of Condition:

Contrary to the above requirements, the following deficiencies were noted:

Calibrated documentation for three balances used by the URS Group did not contain the following information:

- Unique identification of balances being calibrated
- Procedure (including revision level) used to calibrate the balances
- Statement of acceptability
- Specified range and tolerances and whether the balances met those tolerances.

7. Initiator:  
Patrick V. Auer Date 2/26/02

9. Does a stop work condition exist? (Not required for a DR)  
 Yes  No  
 If Yes, Check One:  A  B  C  D

10. Recommended Actions:

None.

11. QA Review:  
 QAR Patrick V. Auer Date 2/24/02

12. Response Due Date:  
 10 Working Days From Issuance

13. DOQA Issuance Approval:  
 Printed Name: Ram Murthy

Signature James Blaylock Date 3/4/02

22. Corrective Actions Verified:  
 QAR Pat Auer Date 5/21/02

23. Closure Approved by:  
 DOE/OQA James Blaylock Date 6/15/02

TYPE RESPONSE:

- Initial
- Complete
- Amended

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RADIOACTIVE WASTE MANAGEMENT  
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WASHINGTON, D.C.**

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**DEFICIENCY/CORRECTIVE ACTION REPORT (RESPONSE)**

14a. Immediate Actions:

The balances were isolated and not used for quality affecting work.

14. Remedial Actions:

A revised calibration sheet was made. A balance check method (attached) used on other similar quality affecting work for YMP was obtained and will be referenced in the Scientific Notebook.

15. Extent of Condition:

Limited to the three balances (Serial Numbers 1114140238, H82541, and H78232). All other URS equipment used in quality affecting work has been submitted to the BN Cal Lab.

Note that the weights used on the balances were submitted to the Bechtel Nevada Calibration Laboratory. The vendor, URS Corp, used the weights to calibrate the balances. However, as noted in this DR they did not use an approved procedure and did not perform all actions required by AP-12.1Q *Control of Measuring and Testing Equipment and Calibration Standards*. The term "calibration" has a specific meaning under AP-12.1Q. The URS balance calibrations should be termed a "calibration check" or "pre-operational check" of the balances. Weights calibrated by the BN Cal Lab were used because they were available.

16. Cause: (Attach results of root cause determination prepared in accordance with AP-16.4Q for a significant deficiency.)

Poor training of URS personnel was the main cause of this DR.

17. Action to Preclude Recurrence:

All URS equipment used for quality affecting work will be calibrated in accordance with AP-12.1Q. URS will add the Calibration Check Method to their Scientific Notebook and train their personnel to use the method.

18. Due Date: 15 May 02

- For submittal of complete response *3/4/02*
- For completion of corrective action (~~all actions are complete~~)

19. Response by: Mark Peters (Resp. Individual: Norman Kramer)

*for MTP RFX* *D g u* *18/3/02*  
Date: 18 Mar 02 Phone: 5-3644

20. Evaluation:  Accept  Partially Accept  Reject

QAR *Pat* *Not Significant* Date *3/27/02*

21. Concurrence:

DOQA *James Blylock* Date *3/29/02*

Submittal Page \_\_\_\_ of \_\_\_\_

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DR/CAR/QO  
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**CONDITION ADVERSE TO QUALITY CONTINUATION PAGE**

VERIFICATION OF CORRECTIVE ACTIONS FOR Deficiency Report (DR) BSC-02-D-076.

Verification of corrective actions for DR BSC-02-D-076 was performed on May 21, 2002. The following documentation was reviewed:

1. Calibration check sheets for Mettler balance #H82541, Mettler balance #H78232 and Toledo balance #1114140238 all completed on May 17, 2002. No out of tolerance conditions were noted.
2. Calibration check method, incorporated on page 98, of scientific notebook SN-M&O-SCI-026-V1, entry dated April 18, 2002.
3. Documentation of understanding of the calibration check method by the calibration technician, dated May 10, 2002.

Based on the reviews of the applicable documetnation, it is recommended that DR BSC-02-D-076 be closed.

Evaluation by

  
Pat Auer

QAR, May 21, 2002

**LABORATORY/ FIELD BALANCE CALIBRATION CHECK**

Manufacturer Toledo  
 Model No. SM 4800  
 Property No. \_\_\_\_\_  
 Serial No. 1114140238

Capacity (kg): 4.1  
 ASTM D 4753 Class: GP2  
 Readability Type: 0.1  
 Tolerance (low mass): 0.2 gram  
 Tolerance (high mass): 0.1 %  
 Low/high mass break: 200 grams

Standard(s) used: USBR 1012, ASTM E 617  
 Cheked by: Tom O'Meara  
 Check Date: 05/10/02  
 ReCheck Due: May-03  
 Input by: Tom O'Meara

URS Weight code	Nominal Mass						Difference from Nominal				% Difference from Nominal			Range from Trials	
	Calibration Standard		Trial 1 grams	Trial 2 grams	Trial 3 grams	Average grams	Trial 1 grams	Trial 2 grams	Trial 3 grams	Average grams	Trial 1	Trial 2	Trial 3	Maximum grams	Minimum grams
	nominal	actual													
---	0	0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.00	0.00	0.00	0.0	0.0	
d2	5	4.999	5.00	5.00	5.00	5.00	0.001	0.001	0.001	0.0	0.02	0.02	0.02	5.0	5.0
e2	10	9.998	10.00	9.99	9.99	9.99	0.002	-0.008	-0.008	0.0	0.02	-0.08	-0.08	10.0	10.0
f2	20	19.997	20.00	20.00	20.00	20.00	0.003	0.003	0.003	0.0	0.02	0.02	0.02	20.0	20.0
h1	50	49.998	50.00	49.99	50.00	50.00	0.002	-0.008	0.002	0.0	0.00	-0.02	0.00	50.0	50.0
j1	100	100.001	100.00	100.00	100.00	100.00	-0.001	-0.001	-0.001	0.0	0.00	0.00	0.00	100.0	100.0
k1	200	199.999	200.00	199.99	200.00	200.00	0.001	-0.009	0.001	0.0	0.00	0.00	0.00	200.0	200.0
m1	500	500.020	500.01	500.00	500.01	500.01	-0.01	-0.02	-0.01	0.0	0.00	0.00	0.00	500.0	500.0
n1	1000	1000.015	1000.0	1000.0	1000.0	1000.0	-0.015	-0.015	-0.015	0.0	0.00	0.00	0.00	1000.0	1000.0
A1	2000	2000.032	2000.0	2000.0	2000.0	2000.0	-0.032	-0.032	-0.032	0	0.00	0.00	0.00	2000	2000
A1,B1	4000	3999.932	3999.9	3999.9	3999.9	3999.9	-0.032	-0.032	-0.032	0	0.00	0.00	0.00	4000	4000
---	---	---				NA	---	---	---	NA	---	---	---	---	---
---	---	---				NA	---	---	---	NA	---	---	---	---	---
	Weight Set(s) Used:		URS 357	Ohaus 201	Tromner 713, 714										
	Calibrated on:		10/16/01	10/17/01	3/8/02										
weight code:	a2	b2	c2	d2	e2	f2	g2	h1	h2	j1	j2	k1	k2	l2	
mass (g):	1.000	1.999	2.999	4.999	9.998	19.997	29.997	49.998	49.990	100.001	99.986	199.999	199.985	299.957	

weight code:	m1	m2	n1	n2	A1	A2	B1	I	II	III	713	714
mass (g):	500.020	499.964	1000.015	999.962	2000.032	1999.900	1999.972	5000.066	4999.995	4999.973	5000.28	10000.46

From the procedure this balance:  X  is approved for use  
 requires additional maintenance or repair

Certified by:  MK  Date:  05-17-02

**LABORATORY/ FIELD BALANCE CALIBRATION CHECK**

Manufacturer Mettler  
 Model No. PM4000  
 Property No. \_\_\_\_\_  
 Serial No. H82541

Capacity (kg): 4  
 ASTM D 4753 Class: GP2  
 Readability Type: 0.1  
 Tolerance (low mass): 0.2 gram  
 Tolerance (high mass): 0.1 %  
 Low/high mass break: 200 grams

Standard(s) used: USBR 1012, ASIM E 617  
 Checked by: Tom O'Meara  
 Check Date: 05/10/02  
 ReCheck Due: May-03  
 Input by: Tom O'Meara

URS Weight code	Nominal Mass						Difference from Nominal				% Difference from Nominal			Range from Trials	
	Calibration Standard		Trial 1 grams	Trial 2 grams	Trial 3 grams	Average grams	Trial 1 grams	Trial 2 grams	Trial 3 grams	Average grams	Trial 1	Trial 2	Trial 3	Maximum grams	Minimum grams
	nominal	actual													
—	0	0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.00	0.00	0.00	0.0	0.0
d2	5	4.999	5.00	5.00	5.00	5.00	0.001	0.001	0.001	0.0	0.02	0.02	0.02	5.0	5.0
e2	10	9.998	10.00	10.00	9.99	10.00	0.002	0.002	-0.008	0.0	0.02	0.02	-0.08	10.0	10.0
f2	20	19.997	20.00	20.00	20.00	20.00	0.003	0.003	0.003	0.0	0.02	0.02	0.02	20.0	20.0
h1	50	49.998	50.00	50.00	50.00	50.00	0.002	0.002	0.002	0.0	0.00	0.00	0.00	50.0	50.0
j1	100	100.001	100.01	100.01	100.01	100.01	0.009	0.009	0.009	0.0	0.01	0.01	0.01	100.0	100.0
k1	200	199.999	200.01	200.01	200.01	200.01	0.011	0.011	0.011	0.0	0.01	0.01	0.01	200.0	200.0
m1	500	500.020	500.04	500.04	500.04	500.04	0.02	0.02	0.02	0.0	0.00	0.00	0.00	500.0	500.0
n1	1000	1000.015	1000.05	1000.05	1000.05	1000.05	0.035	0.035	0.035	0.0	0.00	0.00	0.00	1000.1	1000.1
A1	2000	2000.032	2000.10	2000.10	2000.10	2000.10	0.068	0.068	0.068	0	0.00	0.00	0.00	2000	2000
A1,B1	4000	3999.932	4000.19	4000.19	4000.19	4000.19	0.258	0.258	0.258	0	0.01	0.01	0.01	4000	4000
---	---	---				NA	---	---	---	NA	---	---	---	---	---
---	---	---				NA	---	---	---	NA	---	---	---	---	---
	Weight Set(s) Used:		URS 357	Ohaus 201	Tromner 713, 714										
	Calibrated on:		10/16/01	10/17/01	3/8/02										
weight code:	a2	b2	c2	d2	e2	f2	g2	h1	h2	j1	j2	k1	k2	l2	
mass (g):	1.000	1.999	2.999	4.999	9.998	19.997	29.997	49.998	49.990	100.001	99.986	199.999	199.985	299.957	

weight code:	m1	m2	n1	n2	A1	A2	B1	I	II	III	713	714
mass (g):	500.020	499.964	1000.015	999.962	2000.032	1999.900	1999.972	5000.066	4999.995	4999.973	5000.28	10000.46

From the procedure this balance:  X  is approved for use  
 requires additional maintenance or repair

Certified by:  [Signature]  Date:  05-17-02

**LABORATORY/ FIELD BALANCE CALIBRATION CHECK**

Manufacturer Mettler  
 Model No. PM-34  
 Property No. \_\_\_\_\_  
 Serial No. H78232

Capacity (kg): 34  
 ASTM D 4753 Class: G12  
 Readability Type: 0.1  
 Tolerance (low mass): 0.2 gram  
 Tolerance (high mass): 0.1 %  
 Low/high mass break: 200 grams

Standard(s) used: USBR 1012, ASTM E 617  
 Checked by: Tom O'Meara  
 Check Date: 05/10/02  
 ReCheck Due: May-03  
 Input by: Tom O'Meara

URS Weight code	Nominal Mass						Difference from Nominal				% Difference from Nominal			Range from Trials		
	Calibration Standard		Trial 1 grams	Trial 2 grams	Trial 3 grams	Average grams	Trial 1 grams	Trial 2 grams	Trial 3 grams	Average grams	Trial 1	Trial 2	Trial 3	Maximum grams	Minimum grams	
	nominal	actual														
—	0	0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.00	0.00	0.00	0.0	0.0		
h1	50	49.998	50.0	49.9	50.0	50.0	0.002	-0.098	0.002	0.0	0.00	-0.20	0.00	50.0	49.9	
j1	100	100.001	99.9	100.0	99.9	99.9	-0.101	-0.001	-0.101	-0.1	-0.10	0.00	-0.10	100.0	99.9	
k1	200	199.999	199.9	200.0	199.9	199.9	-0.099	0.001	-0.099	-0.1	-0.05	0.00	-0.05	200.0	199.9	
m1	500	500.020	500.0	500.0	500.0	500.0	-0.02	-0.02	-0.02	0.0	0.00	0.00	0.00	500.0	500.0	
n1	1000	1000.015	1000.0	1000.0	1000.0	1000.0	-0.015	-0.015	-0.015	0.0	0.00	0.00	0.00	1000.0	1000.0	
A1	2000	2000.03	2000.1	2000.1	2000.1	2000.1	0.068	0.068	0.068	0.1	0.00	0.00	0.00	2000.1	2000.1	
I	5000	5000.07	5000	5000	5000	5000	-0.066	-0.066	-0.066	-0.1	0.00	0.00	0.00	5000.0	5000.0	
I,II	10000	10000.06	10000	10000	10000	10000	-0.061	-0.061	-0.061	-0.1	0.00	0.00	0.00	10000.0	10000.0	
I,II,III	15000	15000.03	15000	15000	15000	15000	-0.034	-0.034	-0.034	0	0.00	0.00	0.00	15000	15000	
n1-III	20000	20000.053	20000	20000	20000	20000	-0.053	-0.053	-0.053	0	0.00	0.00	0.00	20000	20000	
—	—	—				NA	—	—	—	NA	—	—	—	—	—	
—	—	—				NA	—	—	—	NA	—	—	—	—	—	
Weight Set(s) Used:		URS 357	Ohaus 201	Tromner 713, 714												
Calibrated on:		10/16/01	10/17/01	3/8/02												
weight code:	a2	b2	c2	d2	e2	f2	g2	h1	h2	j1	j2	k1	k2	l2		
mass (g):	1.000	1.999	2.999	4.999	9.998	19.997	29.997	49.998	49.990	100.001	99.986	199.999	199.985	299.957		
weight code:	m1	m2	n1	n2	A1	A2	B1	I	II	III	713	714				
mass (g):	500.020	499.964	1000.015	999.962	2000.032	1999.900	1999.972	5000.066	4999.995	4999.973	5000.28	10000.46				

From the procedure this balance: X is approved for use  
 requires additional maintenance or repair

Certified by: ML Date: 05-17-02

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Notebo No.

### CALIBRATION CHECK METHOD

A. Equipment whose calibration can be checked by this method are:

Mettler (Serial Numbers H78232 & H82541) and Toledo (Serial Number 1114140238) balances

B. Weights calibrated by the Bechtel Nevada Calibration and Standards Laboratory will be used to check the balances. These sets are NIST traceable through the BN Cal Lab.

C. Balances will be used to determine the weight of a specimen. This weight may be later used in calculation of the mass density or weight-volume relationships.

D. Required accuracy of balances: 0.1% of applied weight.

E. Calibration Check Procedure:

1. The level of the balance is verified to be within range.
2. The surface of the scale is cleaned.
3. The balance is set to zero.
4. An initial weight is placed on the weight balance.
5. The reading on the scale is recorded along with the value of the calibration weight.
6. This process is repeated for at least 10 measurements with heavier calibration weights each time up to the capacity of the balance.
7. The percent difference is calculated using the equation:

$$\text{Percent Difference} = \frac{Y-X}{X} \text{ times } 100\%$$

where: X= Nominal weight of the NIST-traceable calibration weight  
 Y= Reading on the scale.

8. The balance performance is verified and accepted if the percent difference at each measurement is less than or equal to  $\pm 0.1\%$ .

Written by: *Thomas O'Meara*  
 Thomas O'Meara

Checked by: *Michael J. Luebbers*  
 Michael J. Luebbers

*The method above was used to calibrate laboratory balances used in the laboratory tests reported in RTN: 100203EB2CTCTS.01G.*  
*ML 4-18-02*

Continued on Page

Read and Understood By

Signed

Date

Signed

Date

SN

026

### CALIBRATION CHECK METHOD

A. Equipment whose calibration can be checked by this method are:

Mettler (Serial Numbers H78232 & H82541) and Toledo (Serial Number 1114140238) balances.

B. Weights calibrated by the Bechtel Nevada Calibration and Standards Laboratory will be used to check the balances. These sets are NIST traceable through the BN Cal Lab.

C. Balances will be used to determine the weight of a specimen. This weight may be later used in calculation of the mass density or weight-volume relationships.

D. Required accuracy of balances: 0.1% of applied weight.

E. Calibration Check Procedure:

1. The level of the balance is verified to be within range.
2. The surface of the scale is cleaned.
3. The balance is set to zero.
4. An initial weight is placed on the weight balance.
5. The reading on the scale is recorded along with the value of the calibration weight.
6. This process is repeated for at least 10 measurements with heavier calibration weights each time up to the capacity of the balance.
7. The percent difference is calculated using the equation:

$$\text{Percent Difference} = \frac{Y-X}{X} \text{ times } 100\%$$

where: X= Calibrated weight of the NIST-traceable calibration weight  
Y= Reading on the scale.

8. The balance performance is verified and accepted if the percent difference at each measurement is less than or equal to  $\pm 0.1\%$ .

Written by: Thomas O'Meara  
Thomas O'Meara

Checked by: Michael J. Luebbers  
Michael J. Luebbers

I have read and understand the above Calibration Check Method.

Signed by: Thomas O'Meara Date: 5/10/02