CENTER FOR NUCLEAR WASTE REGULATORY ANALYSES

NONCONFORMANCE REPORT

Project No. 20.06002.01.081 **NCR No.** 2004-06

PART 1: DESCRIPTION OF NONCONFORMANCE:
Keithley electrometer 735984 Model # 6517A (Asset number 007670) was found to be out of tolerance during a normally scheduled calibration.

Initiated by: Darrell S. Dunn **Date:** 6/4/2004

PART 2: PROPOSED DISPOSITION AND CORRECTIVE ACTION

Disposition:
Accept data obtained in tests using this electrometer as is.

Basis of Disposition:
The electrometer was found to be out of tolerance multiple ranges including DC Current, Resistance and Charge. The DC Current, Resistance and Charge functions are not used during the measurement of parameters for tests conducted in the laboratory. The electrometer was found to be in tolerance for all parameters that are used in laboratory tests (DC Voltage). Consequently the out of tolerance condition will not adversely affect the parameters measured during testing.

Action to Correct Nonconformance:
The instrument was repaired and returned in tolerance.

Target date for completion: 6/11/2004

Proposed by: Darrell S. Dunn **Date:** 6/4/2004

PART 3: APPROVAL

Element Manager: **Date:** 6/4/2004

Director of QA: **Date:** 6/4/2004

Comments/Instructions:

PART 4: CLOSE OUT

Comments:
No further action required.

Verified by: **Date:** 6/11/04

Distribution: D. Dunn
V. Jain
B. Sagar

CNWRA FORM QAP 9–1

SOUTHWEST RESEARCH INSTITUTE
CALIBRATION LABORATORY
MEMORANDUM

May 14, 2004

To: DARRELL DUNN DIV20 B57

From: Walt Hill, Metrology Group Leader
Institute Calibration Laboratory

Subject: Status of Calibration Supplier

Manufacturer/Model: KEITHLEY 6517A
Description: ELECTROMETER
Serial Number: 0735984
Asset Number: 007670
Work Order Number: 444055341
Date Calibrated: May 8, 2004
Supplier: ROTHE DEVELOPMENT, SAN ANTONIO TX - AUDIT - 648-3131
Remarks: Rothe Cert. #30280: 1084022032

(✓) Supplier is on the Approved Suppliers List (ASL).

( ) Supplier is not on the Approved Suppliers List.

( ) Calibration is ISO 17025 accredited.

(✓) Calibration is not ISO 17025 accredited.

( ) There is no known supplier to meet ISO 17025 accreditation at this time.

Please notify the Institute Calibration Laboratory, extension 5215, of any discrepancies with the item or calibration documentation.

Attachment(s) 7

m:\nonasl2.rpt Rev 7 Dec 01

CERT. NUMBE... 30280:1084022032

Rothe Development, Inc.

METROLOGY SERVICES DIVISION

4614 SINCLAIR RD., SAN ANTONIO, TEXAS 78222 PH:210-648-3131

CERTIFICATE OF CALIBRATION

ISSUED TO: Southwest Research Institute (30)

6220 Culebra
San Antonio, TX 78284

MFG: Keithley
MODEL: 6517A
NOMEN: ELECTOMETER /HI RES
S/N: 0735984
CUST. ID: 7670

CAL DATE: 5/8/04
DUE DATE:

CONTROL NO: 103 - 30280
TECHNICIAN: 4
SPECIFICATIONS: MFG
PROCEDURE: MFG
WORK ORDER: 002032069
CUSTOMER P.O.: 01571R/ST417997/1.20.00755.000
RECEIVED CONDITION: OUT OF TOLERANCE
RETURNED CONDITION: IN TOLERANCE

CALIBRATION PERFORMED AT: RDMSD
CALIBRATION INTERVAL: 0
TEMPERATURE: 72.0°F
RELATIVE HUMIDITY: 35%

DATE RECEIVED: 9/15/03

COMMENTS: TUR ON RESISTANCE SECTION- SEE DATA SHEET.

ATTACHMENTS: CALIBRATION DATA 6 SHEETS

All calibrations performed at Rothe Development, Inc. Metrology Services Division meet the requirements of ANSI / NCSL Z540-1-1994, ANSI / ISO / IEC 17025, ISO / IEC GUIDE 25, and ISO 10012-1, and are traceable to the National Institute of Standards and Technology. The collective uncertainty of the measurement(s) does not exceed 25% (TUR ≥ 4:1) of the instrument specification(s) unless noted in the COMMENTS section.

TR#	MFG	MODEL	SERIAL NO.	DUE DATE
20	FLUKE	5700A/EP	4605002	7/12/2004
258	FLUKE	5725A	6585002	7/12/2004
100	FLUKE	5500A	6320016	10/17/2004
231	HP	34401A	3146A45255	7/15/2004
235	GUILDLINE	6500A	59660	1/22/2005
186	GEN RAD	1689	7241583008	10/13/2004

APPROVED BY: _____ ☑ CMS ☐ QCO **DATE:** 5/11/04

This certificate may not be reproduced, except in full, without written approval of Rothe Development, Inc. Metrology Services Division

ROTHE DEVELOPMENT METROLOGY SERVICES

CALIBRATION DATA: KEITHLEY MODEL 6517A ELECTROMETER

CUSTOMER: SwRI
WO NUMBER: 002032069
SERIAL: 0735984
CUST ID: 7670

DATE: 17 Sep 03
TECH: [illegible]
INST NO: 30280

CALIBRATION DATA TAKEN

INCOMING ✓
OUTGOING

CONDITION OF EQUIPMENT

IN TOLERANCE
OUT OF TOLERANCE ✓ *

DC VOLTAGE ACCURACY

RANGE	INPUT	MIN	READING	MAX
2 V	+1.9 V	1.89949	1.89997	1.90052
	-1.9 V	1.89949	1.89996	1.90052
20 V	+19 V	18.9950	18.9976	19.0050
	-19 V	18.9950	18.9973	19.0050
200 V	+190 V	189.883	189.937	190.117
	-190 V	189.883	189.933	190.117

DC CURRENT ACCURACY

RANGE	INPUT	MIN	READING	MAX
20 pA	19 pA	18.8070	inop	19.1930
200 pA	190 pA	188.095		191.905
2 nA	1.9 nA	1.89590		1.90410
20 nA	19 nA	18.9615		19.0385
200 nA	190 nA	189.615		190.385
2 uA	1.9 uA	1.89800		1.90200
20 uA	19 uA	18.9805		19.0195
200 uA	190 uA	189.805		190.195
2 mA	1.9 mA	1.89800		1.90200
20 mA	19 mA	18.9805		19.0195

*

DOC.DATE: 6/4/2002

COULOMBS ACCURACY

RANGE	INPUT	MIN	READING	MAX
2 nC	1.9 nC	1.89235	inop	1.90765
20 nC	19 nC	18.9235		19.0765
200 nC	190 nC	189.235		190.765
2 uC	1.9 uC	1.89235		1.90765

RESISTANCE ACCURACY

RANGE	INPUT	READING TOLERANCES >1.00000	READING TOLERANCES <.999999	READING	TUR
2 MΩ		±126 C	±1260 C	inop	
20 MΩ		±126 C	±1260 C		3.60
200 MΩ		±151 C	±1510 C		
2 GΩ		±226 C	±2260 C		
20 GΩ		±226 C	±2260 C		3.23
200 GΩ		±351 C	±3510 C		3.51
2 TΩ		±351 C	±3510 C		1.76

VOLTAGE SOURCE ACCURACY

SOURCE RANGE	OUTPUT	MIN	READING	MAX
±100 V	0.000 V	-0.01	0.00	0.01
	+25.000 V	24.9525	24.9961	25.0475
	+50.000 V	49.915	49.9959	50.085
	+75.000 V	74.8775	74.9974	75.1225
	+100.000 V	99.840	99.9946	100.160
	-25.000 V	24.9525	24.9964	25.0475
	-50.000 V	49.915	49.9959	50.085
	-75.000 V	74.8775	74.9935	75.1225
	-100.000 V	99.840	99.9929	100.160
±1000 V	+250.00 V	249.525	249.977	250.475
	+500.00 V	499.150	499.965	500.850
	+750.00 V	748.775	749.966	751.225
	+1000.00 V	998.40	999.960	1001.60
	-250.00 V	249.525	249.974	250.475
	-500.00 V	499.150	499.957	500.850
	-750.00 V	748.775	749.948	751.225
	-1000.00 V	998.40	999.930	1001.60

INST NO: 30280

✓ INCOMING
OUTGOING

DOC.DATE: 6/4/2002

TEMPERATURE AND HUMIDITY TURN ON = MENU / GENERAL / A/D CONTROLS / DATE-STAMP / ∧ OR ∨

TEMPERATURE ACCURACY

TEMP	MIN	READING	MAX
-25° C	-23.4	24.5	-26.6
0° C	-1.5	0.5	+1.5
50° C	48.3	50.3	51.7
100° C	98.2	100.1	101.8
150° C	148.0	150.2	152.0

HUMIDITY ACCURACY

VOLTAGE INPUT	MIN	READING	MAX
0.000 V	0	0	1 %
0.250 V	24	25	26
0.500 V	49	50	51
0.750 V	74	75	76
1.000 V	99	100	101

INST NO: 30280

✓ INCOMING
___ OUTGOING

DOC.DATE: 6/4/2002

ROTHE DEVELOPMENT METROLOGY SERVICES

CALIBRATION DATA: KEITHLEY MODEL 6517A ELECTROMETER

CUSTOMER: SwRI
WO NUMBER: 0020320 69
SERIAL: 0735984
CUST ID: 7670

DATE: 8 May 04
TECH: [illegible]
INST NO: 30280

CALIBRATION DATA TAKEN

INCOMING ____
OUTGOING ✓

CONDITION OF EQUIPMENT

IN TOLERANCE ✓
OUT OF TOLERANCE ____

DC VOLTAGE ACCURACY

RANGE	INPUT	MIN	READING	MAX
2 V	+1.9 V	1.89949	1.89982	1.90052
	-1.9 V	1.89949	1.89982	1.90052
20 V	+19 V	18.9950	19.0000	19.0050
	-19 V	18.9950	19.0000	19.0050
200 V	+190 V	189.883	190.001	190.117
	-190 V	189.883	190.000	190.117

DC CURRENT ACCURACY

RANGE	INPUT	MIN	READING	MAX
20 pA	19 pA	18.8070	18.9923	19.1930
200 pA	190 pA	188.095	190.021	191.905
2 nA	1.9 nA	1.89590	1.89950	1.90410
20 nA	19 nA	18.9615	18.9986	19.0385
200 nA	190 nA	189.615	190.031	190.385
2 uA	1.9 uA	1.89800	1.89937	1.90200
20 uA	19 uA	18.9805	18.9993	19.0195
200 uA	190 uA	189.805	190.000	190.195
2 mA	1.9 mA	1.89800	1.89930	1.90200
20 mA	19 mA	18.9805	18.9995	19.0195

DOC.DATE: 6/4/2002

COULOMBS ACCURACY

RANGE	INPUT	MIN	READING	MAX
2 nC	1.9 nC	1.89235	1.89830	1.90765
20 nC	19 nC	18.9235	18.9847	19.0765
200 nC	190 nC	189.235	189.803	190.765
2 uC	1.9 uC	1.89235	1.90609	1.90765

RESISTANCE ACCURACY

RANGE	INPUT	READING TOLERANCES >1.00000	<.999999	READING	TUR
2 MΩ	1.00000 M	±126 C	±1260 C	1.00010	
20 MΩ	10.0003 M	±126 C	±1260 C	10.0015	3.60
200 MΩ	100.2212 M	±151 C	±1510 C	100.260	
2 GΩ	.995989 G	±226 C	±2260 C	.995872	
20 GΩ	9.97774 G	±226 C	±2260 C	9.96958	3.23
200 GΩ	98.8805 G	±351 C	±3510 C	98.7594	3.51
2 TΩ	.994633 T	±351 C	±3510 C	.995342	1.76

VOLTAGE SOURCE ACCURACY

SOURCE RANGE	OUTPUT	MIN	READING	MAX
±100 V	0.000 V	-0.01	0.000	0.01
	+25.000 V	24.9525	24.9958	25.0475
	+50.000 V	49.915	49.9929	50.085
	+75.000 V	74.8775	74.9919	75.1225
	+100.000 V	99.840	99.9893	100.160
	-25.000 V	24.9525	24.9964	25.0475
	-50.000 V	49.915	49.9931	50.085
	-75.000 V	74.8775	74.9911	75.1225
	-100.000 V	99.840	99.9877	100.160
±1000 V	+250.00 V	249.525	249.945	250.475
	+500.00 V	499.150	499.958	500.850
	+750.00 V	748.775	749.939	751.225
	+1000.00 V	998.40	999.891	1001.60
	-250.00 V	249.525	249.974	250.475
	-500.00 V	499.150	499.922	500.850
	-750.00 V	748.775	749.874	751.225
	-1000.00 V	998.40	999.866	1001.60

INST NO: 30280

DOC.DATE: 6/4/2002

___ INCOMING
✓ OUTGOING

TEMPERATURE AND HUMIDITY TURN ON = MENU / GENERAL / A/D CONTROLS / DATE-STAMP / ∧ OR ∨

TEMPERATURE ACCURACY

TEMP	MIN	READING	MAX
-25° C	-23.4	24.3	-26.6
0° C	-1.5	0.7	+1.5
50° C	48.3	50.5	51.7
100° C	98.2	100.3	101.8
150° C	148.0	150.2	152.0

HUMIDITY ACCURACY

VOLTAGE INPUT	MIN	READING	MAX
0.000 V	0	0	1 %
0.250 V	24	25	26
0.500 V	49	50	51
0.750 V	74	75	76
1.000 V	99	100	101

INST NO: 30280

DOC.DATE: 6/4/2002

___ INCOMING
✓ OUTGOING