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# CENTER FOR NUCLEAR WASTE REGULATORY ANALYSES QUALITY ASSURANCE SURVEILLANCE REPORT

**PROJECT NO:** 20-01402-171

**REPORT NO:** 2002-14

**PAGE** 1 **OF** 2

**SURVEILLANCE SCOPE:** Monitoring Project 20-01402-661 Experiment by Center for Nuclear Waste Regulatory Analyses (CNWRA) personnel

**REFERENCE DOCUMENTS:** CNWRA Quality Assurance Manual Revision 4, Change 2; QAP-004, Surveillance Control Procedure Revision 2.

**STARTING DATE:** 06/17/2002

**ENDING DATE:** 06/19/2002

**QA REPRESENTATIVE:** Thomas A. Mayces, SwRI- Institute Quality Systems *TAM*

**PERSONS CONDUCTING TEST/EXAM/ACTIVITY:** Jim Prikryl

**SATISFACTORY FINDINGS:** Surveillance was performed at CNWRA laboratory of SwRI Building 51 to assure that calibrated test and monitoring equipment used in the experiment were properly identified. All calibrated test equipment was properly labeled. The test setup was described in the Scientific Notebook No. 337 that was continued from Notebook No. 222. The accuracy of the 120 Omega Type K, Cut No. 5TC-TT-K-30-72 thermocouples was checked using a calibrated ERTCO Thermometer, Model ASTM 91C, Serial No. 1709, Asset No. 007617 that was calibrated 3/21/02 and next calibration due 9/21/02. Hewlett Packard (HP) Data Logger software was used with HP 349-70A Data Acquisition instrument using a temperature correction factor that was determined by the program and checked at 22.4°C with satisfactory results that were documented in the Scientific Notebook. Also verified that the placement of the thermocouples was accurately described in the Scientific Notebook.

**UNSATISFACTORY FINDINGS:** Test equipment Model TSI-8345, Serial Nos. 01060216 and 01060220, Velocicalc Portable Air Velocity Meters and their calibration were purchased from a supplier that was not approved for nuclear projects. It should be noted that TSI Incorporation is on the SwRI ASL but they are restricted to be used by Divisions 03 and 16 only.

**NONCONFORMANCE REPORT NO:** 2002-05

**ATTACHMENTS:** CNWRA Nonconformance Report No. 2002-05.

**RECOMMENDATIONS/ACTIONS:** If the TSI air velocity meters are going to be used for more project activities they should be calibrated by a supplier on the ASL approved for nuclear work like Transcat. It was noted that the correction factor for the 120 thermocouples was checked only at 22.4°C yet the projected test ranges from 20°C to 50°C. It was recommended that at the conclusion of the test the correction factor be checked at both ends of the tested range to verify that the correction factor was valid for the test.

**APPROVED:**

*Thomas A. Mayces*  
**CNWRA DIRECTOR OF  
QUALITY ASSURANCE**

**DATE:**

6/21/2002

**DISTRIBUTION:**

**ORIGINAL** – CNWRA QA DIRECTOR QA Records

**CC:** ORIGINATOR – T. Mayces

B. Sagar, E. Percy, R. Fedors, J. Prikryl, and  
M. Ehnstrom.

*Element Managers*

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# CENTER FOR NUCLEAR WASTE REGULATORY ANALYSES NONCONFORMANCE REPORT

Project No. 20-01402-661

NCR No. 2002-05

**PART 1: DESCRIPTION OF NONCONFORMANCE:** Project test equipment Model TSI 8345, TSI Serial Nos. 01060216 and 01060220, Velocicalc Portable Air Velocity Meters and their calibrations were purchased from a supplier that was not approved for nuclear projects.

Initiated by: Thomas A. Mayces *See fol. T. Mayces*

Date: 06/21/02

**PART 2: PROPOSED DISPOSITION AND CORRECTIVE ACTION**

Response Date: 7/8/02  
By E. Deery/J. Prikryl

*A. Choudhury* *SA*  
*6/24/02*

Disposition:

Basis of Disposition:

Action to Correct Nonconformance:

Target date for completion: \_\_\_\_\_

Proposed by:

Date:

**PART 3: APPROVAL**

Element Manager: \_\_\_\_\_

Date: \_\_\_\_\_

Director of QA: \_\_\_\_\_

Date: \_\_\_\_\_

Comments/Instructions:

**PART 4: CLOSE OUT**

Comments:

Distribution:

Original-CENTER QA DIRECTOR QA Records

ORIGINATOR

PRINCIPAL INVESTIGATORS

ELEMENT MANAGERS

B. Sagar, H. Garcia

*J. Prikryl*

Verified by:

Date:

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# TSI CERTIFICATE OF CALIBRATION AND TESTING

TSI Model 8345 TSI Serial No. 01060220

Description VELOCICALC PORTABLE AIR VELOCITY METER

Calibration Standard WIND TUNNEL CALIBRATION SYSTEM, SERIAL NO. 115

## CALIBRATION VERIFICATION RESULTS

Calibration Standard	Instrument Output	Percent Difference	Error Compared to Tolerance		
			Tolerance Limit-	0	Tolerance Limit+
0.0 ft/min	0.0 ft/min			*	
35.6 ft/min	36.0 ft/min	1.1		.*	
66.0 ft/min	65.7 ft/min	-0.5		*.	
100.4 ft/min	100.5 ft/min	0.1		*	
160.7 ft/min	160.3 ft/min	-0.2		*.	
328.0 ft/min	328.9 ft/min	0.3		.*	
650.3 ft/min	650.3 ft/min	0.0		*	
1000.0 ft/min	996.3 ft/min	-0.4		*.	
1475.3 ft/min	1480.3 ft/min	0.3		.*	
2494.4 ft/min	2489.8 ft/min	-0.2		*.	
4493.0 ft/min	4512.9 ft/min	0.4		.*	
5914.4 ft/min	5889.4 ft/min	-0.4		*.	

  

32.0 °F	32.1 °F	
140.0 °C	140.1 °C	

  

**Tolerance Limits:**  
 ± 3% of reading  
 or 5 ft/min  
 whichever is greater

**Velocity Corrected to Std Conditions of:**  
 Ambient Temperature: 21.1°C  
 Barometric Pressure: 760.0 mmHg

TSI Incorporated does hereby certify that all materials, components, and workmanship used in the manufacture of this equipment are in strict accordance with the applicable specifications agreed upon by TSI and the customer and with all published specifications. All performance and acceptance tests required under this contract were successfully conducted according to required specifications. Furthermore, all test and calibration data supplied by TSI has been obtained using standards whose accuracies are traceable to the National Institute of Standards and Technology (NIST) or has been verified with respect to instrumentation whose accuracy is traceable to NIST, or is derived from accepted values of physical constants. Calibration procedures for this instrument comply with MIL-STD-45662A. The accuracy of the calibration facilities is greater than a ratio of 1:1 with respect to the accuracy specifications of the instrument being calibrated.

Applicable Test Report	Report Number	Date Last Verified
DC voltage	517979	09-18-00
Barometric Pressure	P-8264	05-15-00
Temperature (0°C)	254798	08-11-00
Temperature (19-35°C)	203537	08-11-00
Temperature (60°C)	216642	08-11-00
Pressure	822/260205-98	05-08-00
Pressure	822/258703-97	05-08-00
Velocity	836/264927	03-16-01
Dewpoint	257589	02-09-00

Calibrated by L. Swanson  Final Function Check Jun 18, 2001 Calibration Date

TSI Incorporated Environmental Measurements and Controls Division  
 Mailing Address: P.O. Box 64394 St. Paul, MN 55164 USA  
 Shipping Address: 500 Cardigan Road Shoreview, MN 55126 USA  
 Phone: (800) 777-8356 or (651) 490-2711 Fax: (651) 490-2874

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# TSI CERTIFICATE OF CALIBRATION AND TESTING

TSI Model 8345 TSI Serial No. 01060216

Description VELOCICALC PORTABLE AIR VELOCITY METER

Calibration Standard WIND TUNNEL CALIBRATION SYSTEM, SERIAL NO. 106

## CALIBRATION VERIFICATION RESULTS

Calibration Standard	Instrument Output	Percent Difference	Error Compared to Tolerance	
			Tolerance Limit-	Tolerance Limit+
0.0 ft/min	0.0 ft/min		0	
34.6 ft/min	34.2 ft/min	-1.2	*	*
65.2 ft/min	64.8 ft/min	-0.6	*	*
101.0 ft/min	101.2 ft/min	0.2	*	*
158.5 ft/min	157.6 ft/min	-0.6	*	*
330.2 ft/min	329.4 ft/min	-0.2	*	*
657.4 ft/min	652.4 ft/min	-0.8	*	*
1002.7 ft/min	999.8 ft/min	-0.3	*	*
1470.3 ft/min	1473.6 ft/min	0.2	*	*
2501.8 ft/min	2488.8 ft/min	-0.5	*	*
4496.7 ft/min	4476.1 ft/min	-0.5	*	*
5858.2 ft/min	5858.1 ft/min	-0.0	*	*

### Tolerance Limits:

± 3% of reading

or 3 ft/min

whichever is greater

Velocity Corrected to Std Conditions of:

Ambient Temperature: 21.1°C

Barometric Pressure: 760.0 mmHg

TSI Incorporated does hereby certify that all materials, components, and workmanship used in the manufacture of this equipment are in strict accordance with the applicable specifications agreed upon by TSI and the customer and with all published specifications. All performance and acceptance tests required under this contract were successfully conducted according to required specifications. Furthermore, all test and calibration data supplied by TSI has been obtained using standards whose accuracies are traceable to the National Institute of Standards and Technology (NIST) or has been verified with respect to instrumentation whose accuracy is traceable to NIST, or is derived from accepted values of physical constants. Calibration procedures for this instrument comply with MIL-STD-45662A. The accuracy of the calibration facilities is greater than a ratio of 1:1 with respect to the accuracy specifications of the instrument being calibrated.

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Velocity	836/264927	03-16-01
Dewpoint	257589	02-09-00

J. Swanson  Final Calibration Date Jun 18, 2001  
Calibrated by J. Swanson Function Check

TSI Incorporated Mailing Address: P.O. Box 64394 St. Paul, MN 55164 USA  
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and Controls Division Phone: (800) 777-8356 or (651) 490-2711 Fax: (651) 490-2874

Supplier Name	City/State	Quality System	Basis for Acceptance	Nuclear Qualified ?	Restriction	Rating*	Product/Service	Comments
SwRI Calibration Laboratory	San Antonio	TX Z540	Accreditation	YES	None	ND	Calibration of measuring, test, and inspection equipment	
SwRI Division 15 Special Process Lab	San Antonio	TX QSM	Audit	NO	None	ND	Metal surface treatment (anodizing, plating, silk screening, etc.) to military	
SwRI Machine Shop	San Antonio	TX Various	Performance based	NO	100% QA Inspection	ND	General Machining Services	
Technology & Calibration	Houston	TX Z540	Audit	YES	None	100%	Pressure Instrument Calibration	
Tektronix	Irving	TX Z540	Audit	NO	None	100%	Test instrument repair and calibration	
Texas Toolmakers	San Antonio	TX ISO 9002	Audit	YES	None	80%	machine fabrication and mold shop	
Tinius Olsen	Willow Grove	PA 17025	A2LA Accreditation	YES	None	ND	Calibration of Load Machines and other devices	Contact Cal Lab for Scope of Accreditation
Transcat	*See Product/Service	G25&Z540	A2LA Accreditation	YES	None	100%	Calibration Services - All Transcat locations approved	Contact Cal Lab for Scope of Accreditation
TRM (Technical Research & Manufacturing)	Bedford	NH ISO 9001	Certification	NO	None	85%	RF/Microwave signal processing components	ISO 9001
Troemner, Inc	Thorofare	NJ Z540	Accreditation	YES	None	100%	Calibration of mass instruments	Contact Cal Lab for Scope of Accreditation
TRS (formerly Newcourt)	DFW Airport	TX Z540	Audit	YES	None	ND	Calibration services for rental equipment	
TSI Incorporated	St. Paul	MN ISO 9001	Certification	NO	Div 03 or 16 only **	100%	Calibration of TSI Units Only	** Not Z540; Not approved for Guide 25 Programs
UNI-FORM Components Co.	Houston	TX ASME VIII	Questionnaire & Cert	NO	None	ND	Pressure vessel head fabrication	ASME Certified
Vacuum Technology, Inc.	Oak Ridge	TN ISO17025	Accreditation	YES	None	ND	Calibration of leak detectors	Contact Cal Lab for Scope of Accreditation

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