ACTIVITY/PROJECT SPECIFIC PROCEDURE

SP 12-20
THERMOMETER CALIBRATION CHECK
Revision 0

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Original signed by Shelly R. Johnsen 11-28-07
(printed name) (signature) (date)

1.0 Purpose and Scope

This document describes the Sandia National Laboratories (SNL) Waste Isolation Pilot Plant (WIPP) procedure for the calibration check of thermometers. Calibration check and operation requirements are included in the procedure. This SP is in support of activities described in several WIPP Test Plans (TPs). Both SNL and contractor personnel will use this SP.

Acronyms and definitions for terms used in this procedure may be found in the Glossary located at the Sandia National Laboratories (SNL) WIPP Online Documents web site.

2.0 Implementation Actions

Several different models and brands of thermometers will be used for the experimental work in support of the WIPP-related studies. Guidelines for implementing and documenting quality assurance (QA) procedures are presented in this document and follow the requirements given in Nuclear Waste Management Procedure (NP) 12-1, Control of Measuring and Test Equipment.

2.1 Safety

The activities described in this SP shall conform to the SNL Environmental Safety and Health programs (ES&H) as described in the laboratory standard operating procedure (SOP) (Deng, 2006 or most recent version). Some thermometers contain mercury and spills may be cleaned as per MN471001 ES&H Manual SECTION 10E – CHEMICAL SPILLS.

2.2 Responsibility

The Principal Investigator (PI), or designee, whose activities warrant the use of this procedure, is responsible for implementing the requirements of this procedure.

The PI or designee is responsible for performing the calibration checks and measurements following the requirements of this procedure, documenting calibrations, and assuring that the latest revision of this document is followed.

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2.3 Thermometer Selection

The PI or designee will ensure that the thermometers are of the proper type, design, range, accuracy, and tolerance to accomplish their required function.

2.4 Identification

The thermometers are identified by serial number, if applicable. When not supplied with a serial number, the thermometers will each be assigned a permanent number that will be recorded in the scientific notebook and/or logbook, when that thermometer is used.

2.5 Calibration

2.5.1 Standard

The calibration check will be performed using a certified calibrated thermometer. The certified calibrated thermometer is calibrated by the SNL Primary Standards Laboratory (PSL) and is received with a calibration report that is submitted to records. The identity, serial number, and calibration expiration date of the certified thermometer used shall be documented on [Form SP 12-20-1].

A certified calibrated thermometer will not be used past its expiration date listed on the calibration label provided by PSL.

The calibration check temperature ranges are chosen so that their values bracket the values of the temperatures to be measured. The thermometer should be checked for the largest possible temperature range (e.g. 0°C to 100°C). At least 5 different temperatures must be tested. The increment between the temperature points shall not be smaller than 5°C nor larger than 10°C.

2.5.2 Frequency

The thermometers will be calibration checked annually. The thermometers will also be calibration checked if irregular temperature readings are observed.

2.5.3 Acceptance Criteria

A calibration check is acceptable if, for each temperature checked, the difference between the temperature read on the certified calibrated thermometer and the temperature on the tested thermometer does not exceed the value of one gradation of the tested thermometer. If the temperature value exceeds one gradation, the thermometer must be tested again. If the temperature still exceeds one gradation, the thermometer will be removed from service and tagged according to NP 12-1, Control of Measuring and Test Equipment.

2.5.4 Corrective Action

If during the calibration check the thermometer is found out of tolerance, a Corrective Action Request (CAR) will be issued to document the results and impacts related to the change in the thermometer performance. Corrective action could include an evaluation to any temperature measurements collected or a re-evaluation of the calibration check interval. Results of all activities related to the out-of-tolerance will be summarized in the CAR per the requirements in NP 16-1, Corrective Action.
2.6.  **Temperature Measurements**

A calibrated or calibration checked thermometer shall be used to monitor oven, incubator, water bath, solution or room temperatures. The oven, incubator, and water bath temperatures will be documented in the Oven Temperature Logbook and all other temperature measurements will be recorded as applicable in a scientific notebook.

2.7  **Maintenance**

The thermometers shall be stored so as to minimize their exposure to dusty and corrosive environments, temperatures outside the range of the thermometer, and mechanical shock and vibration.

3.0  **Records**

The following QA records generated through implementation of this procedure shall be prepared and submitted to the WIPP Records Center in accordance with [NP 17-1](#) Records.

- **QA Record**
  - Scientific Notebook
  - Oven Temperature Logbook
  - Form SP 12-20-1, Thermometer Calibration Check

4.0  **Appendices**

Appendix A:  Form SP 12-20-1, Thermometer Calibration Check
# Appendix A

## Thermometer Calibration Check

<table>
<thead>
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<th>Test Operator</th>
<th>Date:</th>
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<tbody>
<tr>
<td>Certified Calibrated Thermometer:</td>
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<tr>
<td>Manufacturer:</td>
<td>Model:</td>
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<tr>
<td>Tested Thermometer ID:</td>
<td></td>
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<tr>
<td>Temperature Range:</td>
<td></td>
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<tr>
<td>Acceptance Criteria:</td>
<td>± 1 thermometer gradation</td>
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<tr>
<td>Tested Thermometer Calibration Expiration Date:</td>
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</tbody>
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<table>
<thead>
<tr>
<th>Certified Calibrated Thermometer (°C)</th>
<th>Tested Thermometer(°C)</th>
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Notes:
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