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CCP-TP-098

Revision 3

CCP
Installation of the NucFil HSG Sample Port

EFFECTIVE DATE: 06/20/2005

David H. Haar

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RECORD OF REVISION

Revision Number	Date Approved	Description of Revision
0	07/21/2003	Initial Issue.
1	12/02/2003	Incorporated recommendations from the October 2003 Management Assessment.
2	03/19/2004	Revised Section 2.0 and 4.0 to incorporate changes to the NucFil™ Installation Unit operating pressure, updated specifications per the manufacturer's instructions and inserted steps 4.2.4, 4.2.7[B.1] and [[B.2].
3	06/20/2005	Revised procedure to reflect process changes.

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1.0 PURPOSE

The Central Characterization Project (CCP) is the tenant in several nuclear facilities supporting the handling, characterization, repackaging, certification, and transportation of transuranic (TRU) waste that will ultimately be shipped to the Waste Isolation Pilot Plant (WIPP) for disposal. In support of the CCP, personnel sample the headspace of TRU waste containers for volatile organic compounds (VOCs) and for hydrogen and methane.

This technical procedure identifies and describes the steps for installation of sample ports that enable the sampling of the headspace for VOCs. Included are the steps to be taken to ensure that personnel and the environment are protected, and that the containers are fitted with a filter acceptable for shipment to WIPP.

1.1 Scope

This procedure applies to CCP direct and subcontract personnel who perform installation of sample ports on TRU waste containers.

2.0 REQUIREMENTS

2.1 References

Baseline Documents

- *NUCFIL Headspace Gas Sample Port Installation System Operating Manual*
- CCP-QP-016, *CCP Control of Measuring, Testing, and Data Collection Equipment*

Referenced Documents

- CCP-PO-005, *CCP Conduct of Operations*
- CCP-QP-002, *CCP Training and Qualification Plan*
- CCP-QP-008, *CCP Records Management*
- CCP-TP-082, *CCP Preparing and Handling Waste Drums for Headspace Gas Sampling*

2.2 Training Requirements

2.2.1 Personnel performing this procedure will be trained and qualified in accordance with CCP-QP-002, *CCP Training and Qualification Plan* prior to performing this procedure.

2.3 Equipment List

NOTE

Operators will be installing a Nucfil-050-SH or Nucfil-050-FT, **OR** verifying the existence on a Nucfil 019DS Filter.

2.3.1 NucFil-050-SH sample port **OR** NucFil-050-FT sample port including:

- Lid penetrating tip
- O-ring
- Seal screw

2.3.2 NucFil™ Sample Port Installation System listed below:

- Pneumatic driver
- Mobile workstation
- Insertion tool
- Remote control

2.3.3 Calibrated torque wrench capable of a 0-100 in-pounds torque range

2.3.4 ½ inch Socket

2.3.5 Calibrated ultrasonic micrometer

2.3.6 Cheesecloth

2.3.7 Kimwipes

2.3.8 RTV-732 sealant **OR** equivalent

2.3.9 Ultrasonic Couplant Gel

2.3.10 Permanent marker

2.3.11 EP-2 grease **OR** equivalent

2.3.12 Scraper

2.3.13 All purpose cleaner

2.3.14 0.0625 inch calibrated gauge block

2.3.15 Inert gas cylinder (e.g., nitrogen gas) **OR** "house air" with air lines and regulator

2.3.16 5/64" Allen Wrench

2.3.17 HSG Operations Logbook

2.4 Precautions and Limitations

2.4.1 Perform sample port installation in accordance with this procedure ensuring the following:

[A] Drums are properly vented prior to installing the sample port (e.g., Nuclear Filter Technology (NFT), 013, 019, and 072 filters).

[B] ONLY NucFil™ approved sample ports are used with the installation system.

2.4.2 Maximum allowable pressure for operation of the mobile workstation is 135 pounds per square inch gauge (psig). The Pneumatic Driver Output Regulator has a limiting pressure setting of 125 psig and a pressure relieve valve set at 135 psig.

2.4.3 Maximum allowable pressure for operation of the Pneumatic Driver Output Regulator is 120 psig.

2.4.4 Operation of the Pneumatic Driver is by remote control.

[A] Maximum operating range for the remote control is approximately 20 feet from the drum.

[B] Minimum safe distance from the drum when installing the sample port is 5 feet.

2.4.5 The pneumatic driver locking clamps are designed for one size of drum only (i.e., 30, 55, or 83-gallons). Ensure the proper clamps are used for the drum to be sampled.

2.4.6 The pneumatic driver must be clamped in a near-perpendicular position relative to the drum to ensure proper installation of the sample port.

2.4.7 Sample port installation location is selected so that the drum lid locking ringbolt will **NOT** interfere with the attachment of the locking clamps of the pneumatic driver.

2.4.8 When using house air to power the mobile workstation, the air supply must be dry **AND** filtered.

2.5 Prerequisite Actions

2.5.1 Workers who will be working in an area controlled for radiological purposes must have read and signed the applicable Radiation Work Permit (RWP), and received orientation to the applicable Host site work control documents.

2.5.2 Wear the following personal protective equipment (PPE), as needed:

- Safety shoes and gloves throughout operation
- ANSI approved safety glasses with side shields
- Leather gloves, as needed
- Booties
- Hearing protection during installation of the sample port
- Respiratory protection, as directed by the Radiological Control Technician (RCT)
- Coveralls or other protective clothing, as directed by the RWP

2.6 Definitions

2.6.1 **Filter vent** - A replaceable assembly containing a filter medium. that can be installed in a drum.

2.6.2 **Headspace gas (HSG)** - Headspace is the total contained volume of a container minus the volume occupied by the waste. The HSG is the gas within the headspace of the container.

2.6.3 **Sample port** - A remotely installed device used to sample the HSG of a drum.

2.6.4 **Waste drum** - A container approved as a payload container for shipping waste to, and disposing of it at WIPP.

3.0 RESPONSIBILITIES

3.1 CCP Vendor Project Manager (VPM)/Designee

3.1.1 Ensures implementation of the requirements in this procedure.

3.1.2 Ensures adherence to the requirements specified in this document during programmatic operations.

3.1.3 Ensures all personnel under their oversight understand the requirements in this procedure, **AND** apply them during installation operations.

3.1.4 Coordinates with the Host site operations personnel to have drums provided for installation of sample ports.

3.1.5 Reviews Attachment 1, Sampling Port Installation Record, for accuracy and completeness.

3.2 Sample Port Installation Technician

3.2.1 Wears the proper PPE in accordance with standard operating procedures for the facility in which the operation is performed.

3.2.2 Installs sample ports for HSG sampling using this procedure.

3.2.3 Operates and maintains sample port equipment.

3.2.4 Ensures that Attachment 1 **AND** maintenance records are complete and accurate.

3.3 Radiological Control Technician (RCT)

3.3.1 Performs duties in support of this procedure in accordance with Occupational Radiation Protection Requirements.

3.3.2 Determines radiological PPE based on facility and site conditions/requirements.

3.3.3 Conducts surveys of personnel and equipment performing this procedure.

3.4 Facility Records Custodian

3.4.1 Transmits all records generated by this procedure in accordance with CCP-QP-008, *CCP Records Management*.

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4.0 PROCEDURE

NOTE

If during the course of executing the requirements of this procedure, an off-normal situation occurs that causes deviation from the normal process, and this off-normal condition CAN **NOT** be corrected as directed in this procedure, the Sample Port Installation Technicians shall IMMEDIATELY cease operations, **AND** notify the VPM **AND/OR** the RCT to evaluate the situation.

Technician

4.1 Pre-start Operations

4.1.1 Confirm in the HSG Logbook that the following lubrications have been performed and are current.

[A] Pneumatic Drive Handle

[A.1] Verify that two drops of pneumatic tool oil have been added daily to the input end of pneumatic drive handle.

[A.2] **IF NOT** documented, **OR NOT** current, **THEN** add the pneumatic tool oil, **AND** document in the HSG Logbook.

[B] Locking Clamps-Weekly Lubrication

[B.1] Verify that the weekly lubrication of the locking clamps have been performed **AND** documented in the HSG Logbook.

[B.2] **IF NOT** documented, **OR NOT** current, **THEN** apply one drop of oil/grease to the surface of the three locking clamps, **AND** document in the HSG Logbook.

[C] Locking Clamp Arms-Monthly Lubrication

[C.1] Verify that the monthly lubrication of the locking clamp has been performed **AND** documented.

[C.2] **IF NOT** documented, **OR NOT** current, **THEN** add oil/grease to both ends of the threads on the locking clamp arms, **AND** document in the HSG Logbook.

4.1.2 Verify that the the pneumatic driver is in good material condition, connections tight moving free to function, and pressure regulations set to minimum.

4.2 Verification of Tools and Equipment

4.2.1 Record Sampling Port Installation Date on Attachment 1.

4.2.2 Verify current calibration of the torque wrench **AND** record Torque Wrench serial number, Calibration Due Date, **AND** initial Attachment 1.

4.2.3 Verify current calibration of the gauge block(s) and record Gauge Block(s) file number, Calibration Due Date, **AND** initial Attachment 1.

4.2.4 Verify current calibration of the High Precision Ultrasonic Micrometer, **AND** record High Precision Ultrasonic Micrometer serial number, Calibration Due Date, **AND** initial Attachment 1.

4.2.5 Verify high precision ultrasonic micrometer accuracy by performing the following:

[A] Place industrial ultrasonic Couplant gel on the tip of the micrometer.

[B] Place the high precision ultrasonic micrometer against the gauge block.

[C] Record Reading, **AND** initial Attachment 1.

NOTE

The allowable range for the verification on the high precision ultrasonic micrometer is 0.0620-0.0630. If **NOT** within allowable range, work must be stopped, the ultrasonic micrometer must be placed in a safe configuration and the VPM notified.

4.2.6 Completely clean any residue off the gauge block **AND** the High Precision Ultrasonic Micrometer.

4.3 Setup and Drum Lid Measurement

NOTE
To address the graded approach in accordance with CCP-PO-005, *CCP Conduct of Operations*, multiple drums may be scraped and measured in this section without other sections being completed.

4.3.1 Wipe down all drum lids using cheesecloth/Kimwipes and all purpose cleaner.

4.3.2 Record all Container (Drum) Numbers on Attachment 1.

4.3.3 Identify existing Sampling Port Type, if one exists, and checkmark the appropriate box on Attachment 1.

4.3.4 Visually inspect existing sample port, **AND** verify the seal is in good condition for sampling for a container that presently has a NucFil 050SH, NucFil 050FT sampling port or a NucFil 019DS filter with integral Sampling Port,
THEN GO TO step 4.7.13.

4.3.5 **IF** there is no Sampling Port,
THEN continue with step 4.3.6.

NOTE
The sample port location should be selected so that the drum lid locking ringbolt will **NOT** interfere with the installation of the pneumatic driver.

4.3.6 Using sample port installation fixture, determine the select location by marking an X with permanent marker where the sample port is to be installed.

4.3.7 Scuff paint off the drum lids at the predetermined locations.

4.3.8 Re-wipe drum lids free of any loose debris.

4.3.9 Measure the drum lid thickness at the predetermined location using a high precision ultrasonic micrometer and industrial ultrasonic Couplant gel or equivalent.

CAUTION

The system is **NOT** to be used on drum lids where the thickness exceeds 0.068 inch because of the 120 psig limitations.

4.3.10 **IF** the drum lid thickness exceeds 0.068 inch **AND** contains drum filter,
THEN prepare drum for sampling in accordance with CCP-TP-082, *CCP Preparing and Handling Waste Drums for Headspace Gas Sampling*, **AND** note in Comments section of Attachment 1.

4.3.11 **IF** the drum lid thickness exceeds 0.068 inch, **AND** DOES **NOT** contain a filter,
THEN reject the drum, **AND** notify the VPM, **AND** note in Comments section of Attachment 1.

4.3.12 **IF** the high precision ultrasonic micrometer reads out to more than the three figures after the decimal place for the drum thickness listed in Table 1, Sample Port Installation Pressure,
THEN round the number in accordance with standard rounding rules:

- **IF** the digit 5, 6, 7, 8, or 9 is dropped,
  THEN increase preceding unit by 1 unit

- **IF** the digit 0, 1, 2, 3, or 4 is dropped,
  THEN DO **NOT** alter the preceding digit

4.3.13 Record lid thickness on drum lids using permanent marker.

4.3.14 Record all drum Lid Thicknesses on Attachment 1.

4.4 Attachment Pressure Source

CAUTION

The maximum allowable pressure for operation of the mobile workstation is 135 psig.

4.4.1 Attach pressure source to the mobile workstation from inert gas cylinder **OR** house air with air lines and regulator (e.g., nitrogen gas).

4.4.2 **IF** using an external pressure source,
THEN set the output pressure to 135 psig.

4.4.3 Connect the NucFil™ power cable to mobile workstation.

4.4.4 Connect the NucFil™ air line to the mobile workstation.

4.5 Setting Up the Sample Port Installation System

4.5.1 Verify that the power cable is **NOT** attached to pneumatic driver.

4.5.2 Verify that the air line is **NOT** attached to the pneumatic driver.

4.5.3 Place the sample port installation fixture at the predetermined location on the drum lid and the filter vent cap over the filter.

CAUTION

Once the sample port has been inserted in the pneumatic driver, take care **NOT** to knock the sample port loose.

4.5.4 Select the proper sample port for appropriate lid thickness in accordance with Table 1, **AND** record Sampling Port Type on Attachment 1.

4.5.5 Inspect the sample port to ensure the lid-penetrating tip, O-ring, and seal screw are in place.

4.5.6 **IF** sample port lacks any of the items listed above,
THEN reject, discard, **AND** replace with a new sample port.

4.5.7 Use an Allen wrench to ensure seal screw is tightened.

4.5.8 Insert sampling port into the pneumatic driver using the insertion tool.

4.5.9 Place the pneumatic driver in a VERTICAL position on the drum lid, **AND** lock pneumatic driver arm clamps onto the drum.

4.5.10 Verify that the main air pressure switch and the power switch are in the OFF position.

4.5.11 Connect the air line to the pneumatic driver.

4.5.12 Connect the power cable to the pneumatic driver.

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4.5.13 Verify locking pin on quick disconnect is fully engaged.

4.5.14 Determine appropriate pressure for sample port installation based on Sample Port Type inserted in pneumatic driver in step 4.5.4, **AND** Drum Lid Thickness measured in step 4.3.14 using Table 1.

Table 1. Sample Port Installation Pressure

Drum Lid Thickness (inch)	Suggested System Operating Pressure (psig)	Sample Port Type
.042-.046	95	050-SH
.047-.052	105	050-SH
.053-.059	120	050-SH
.030-.035	60	050-FT
.036-.041	75	050-FT
.042-.046	85	050-FT
.047-.052	95	050-FT
.053-.059	105	050-FT
.060-.063	110	050-FT
.064-.068	120	050-FT

4.5.15 Place the power switch **AND** the main air pressure switch on the mobile workstation to the ON position.

4.5.16 Adjust regulator pressure on the mobile workstation to the air pressure determined in step 4.5.14.

4.5.17 Record Regulator Pressure setting on Attachment 1.

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4.6 Installation of Sample Port

CAUTION

Hearing and eye protection are required during activation/installation of the pneumatic driver.

WARNING

All personnel in the area are to maintain a minimum distance of five (5) feet from the drum during activation of the pneumatic driver.

4.6.1 Activate the pneumatic driver using the remote control.

4.6.2 Place the main air pressure switch and the power switch on the mobile workstation to the OFF position.

4.6.3 Release pressure from air line by adjusting the regulator dial to its lowest setting.

4.7 Post Installation Check

4.7.1 Disconnect the power cable and air line from the pneumatic driver.

CAUTION

While removing the pneumatic driver from the drum lid, maintain it in a near vertical position to ensure that the installed sample port is **NOT** loosened.

4.7.2 Remove the pneumatic driver from the drum lid.

4.7.3 RCT, perform contamination survey around sampling port and the pneumatic driver.

4.7.4 **IF** contamination is found,
THEN decontaminate in accordance with RCT instructions.

4.7.5 Remove the filter vent cap **AND** sample port installation fixture from drum lid.

4.7.6 Torque the sample port to 15 in-lbs.

4.7.7 Visually inspect to ensure that the sample port is fully installed **AND** the gasket appears to be slightly compressed against the drum lid.

CAUTION

DO **NOT** torque sample port beyond 50 in-lbs. This will prevent the stripping of the threads.

4.7.8 **IF** the sample port DOES **NOT** pass the visual inspection,
THEN torque the sample port in 5 in-lb increments,
AND visually inspect to ensure that the sample port is fully installed
AND the gasket appears to be slightly compressed against the drum lid.

4.7.9 **IF** the sample port passes visual inspection,
THEN STOP increment process as in step 4.7.8.

4.7.10 **IF** the threads on the sample port are stripped **OR** a good seal CAN **NOT** be obtained to the 50-lb torque increment,
THEN perform the following:

[A] Seal the sample port to the drum lid with RTV-732 sealant **OR** equivalent, **AND** allow five minutes set time.

[B] **AFTER** the RTV-732 sealant **OR** equivalent has set,
THEN make an additional seal between the sample port and the drum lid, completely covering the gasket, but **NOT** the seal screw with sealant.

4.7.11 Record Torque Value on Attachment 1. For ports that have been stripped or a good seal could not be obtained, record "stripped" for the torque value.

4.7.12 Initial Attachment 1 for the completed drum.

4.7.13 **IF** previously ported,
THEN record in Comments section of Attachment 1.

4.7.14 **IF** sample port activities are continuing,
THEN GO TO Section 4.5 and continue operation.

4.7.15 **WHEN** sample port activities are complete for the day,
THEN depressurize, disconnect,
AND store all equipment in the appropriate area.

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4.7.16 Complete the Operator information on the bottom of Attachment 1, **AND** initiate NCRs as necessary for stripped drums.

4.8 Reviewing and Processing of the Sampling Port Installation Record

VPM/Designee

4.8.1 Review Attachment 1, for completeness, **AND** sign and date the record.

SIGN-OFF

4.8.2 Submit the completed Attachment 1 to the Facility Records Custodian for transmittal as a record.

Facility Records Custodian

4.8.3 Transmit the completed Attachment 1 in accordance with CCP-QP-008.

5.0 RECORDS

5.1 Records generated during the performance of this procedure are maintained as Quality Assurance (QA) records in accordance with CCP-QP-008. The records are the following:

5.1.1 QA/Nonpermanent

[A] Attachment 1 – Sampling Port Installation Record

Attachment 1 – Sampling Port Installation Record

4.2.1 Sampling Port Installation Date: _____

Step		Initials
4.2.2	Torque wrench serial number: Cal. Due Date:	
4.2.3	Gauge block file number: Cal. Due Date:	
4.2.4	High precision ultrasonic micrometer serial number: Cal. Due Date:	
4.2.5	High precision ultrasonic micrometer accuracy Reading:	

CAUTION: The system is **NOT** to be used on drum lids where the thickness exceeds 0.068 inch.

*If NucFil™ 019 DS filters are used, the Columns with an asterisk (*) do **NOT** apply.

Container (Drum) No. Step **4.3.2**	**Sampling Port Type** Step 4.3.3 and 4.5.4			**Lid Thickness*** Step **4.3.14**	**(Regulator) Pressure*** Step **4.5.17**	**Torque Value*** Step **4.7.11**	**Operator Initials** Step **4.7.12**	**Comments** Steps 4.7.13 and 4.3.11
	050SH	**050FT**	**019DS**					

	(4.7.16) **Operator: Printed Name**	**Signature**	**Date**
1			
2			
3			

VPM Review:_____ _____ _____
(4.8.1) **Printed Name** **Signature** **Date**