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1.0  PURPOSE AND SCOPE

(5.1.1, 5.1.2.f)

This standard implements radioactive airborne effluent sample operating and handling requirements for radioactive emission point sources (i.e. stacks) equipped with permanently installed sample extraction and collection systems (i.e., stack sampling systems). These requirements, applicable to all Tank Operating Contractor (TOC) stacks, are incorporated into facility-specific operating and maintenance procedures.

2.0  IMPLEMENTATION

This standard is effective on the date shown in the header.

3.0  STANDARD

3.1  Inspection of Sampling Systems

(5.1.2.a, 5.1.2.b, 5.1.2.c, 5.1.2.e, 5.1.3)

A limited inspection of sampling systems is performed each day the system is operating. Daily inspections are optional on weekends and holidays for stacks listed in RPP-16922 Table 2-3.

3.1.1  Limited Inspection of Sampling Systems

(5.1.2.a)

Limited inspections are simple operational inspections intended to verify sampler operation and identify obvious problems. Sampling systems are to operate within tolerances prescribed by the Operations Radiological Inspections Procedures (TF-OPS). RadCon staff address the following during the limited inspection of sampling systems:

- Sampling system is operating within TF-OPS procedure e limits
- Inspections are documented on TF-OPS round sheets
- Problems or discrepancies are documented on TF-OPS rounds sheets
- Problems or discrepancies are screened by the Central Shift Manager (CSM) or Area Dayshift Manager (ADM) against criteria in TF-REC-001 ‘Response to Environmental Condition’ for reporting to the Environmental Protection Organization (EPO)
- Problems or discrepancies are evaluated by the CSM or ADM per TFC-OPS-OPER-C-60 ‘Surveillance Rounds’ for corrective actions or inclusion in the Rounds Action Tracking List (RATL).

3.1.2  Comprehensive Inspections of Sampling Systems

Comprehensive inspections are detailed inspections of the sampling systems intended to identify problems with the system. RadCon staff address the following during the comprehensive inspection of sampling systems:

- The sample filter and screen are in place
- Integrity of system assemblies (e.g., disconnected or loose sampling line)
- Condition of rubber o-rings on sample holder
- Sampling system is operating within the facility prescribed tolerance limits
- Housekeeping
- Ventilation and/or heating, ventilation, and air conditioning (HVAC) is inspected
- General maintenance (e.g., lighting, strobe warning light, door latches, and hinges)
- Inspections are documented
- Problems or discrepancies are documented during inspections
- Problems or discrepancies are reported to the responsible Operations Management such as the CSM
- Any instruments not operating within specifications or malfunctioning are evaluated for corrective actions by the responsible Operations Management.

3.2 Sample Collection Frequency

1. Recommended sampling frequencies are evaluated by the EPO and documented in TF-OPS series of procedures.

2. A recommended best management practice is to exchange samples whenever sampler totalizers are exchanged.

3.3 Sampling Documentation

Sample collection data is documented in the Automated Bar Coding of All Samples at Hanford (ABCASH) database or on the air sample envelope and a Chain of Custody/Sample Analysis Request, Site Form #A-6003-962.

3.4 Sample Exchange

Sample exchange is performed by Radiological Control Technicians (RCT). The following information is typically collected and recorded in ABCASH or on the sample envelope during sample exchange:

1. Electronic Data Processing (EDP) also referred to as the ABCASH location code.

2. Sample “off” information for all samples

3. Applicable stack flow “off” totalizer value is recorded.

4. Previous sample is removed and placed in the white sample envelope. Do not remove the sample from the envelope once it has been inserted.
5. A new blank sample is installed in the sample holder and reassembled.

6. Timer is reset, if present and operable.

7. After installation, reassembly, and startup (if appropriate), the flow rate is ensured to be operating within the TF-OPS procedure tolerances.

8. Applicable stack flow on totalizer value is recorded.

9. Sample “on” information is recorded in the ABCASH database or on the appropriate sample envelope.

10. Chain-of-custody is initiated.

11. All sample envelopes are surveyed and survey results are recorded on the backside of the envelope.

12. Samples are logged in the facility record sample log.

13. Samples are prepared for delivery to the Mission Support Contractor (MSC) Sample Receiving.

3.5 **Chain of Custody**

(5.1.2.f)

1. Chain of custody is required for all airborne effluent samples including the record sample and stack continuous air monitor samples.

   a. Evidence of collection, temporary storage, and shipment is documented.

   b. Documentation is generated through procedures that describe and document how physical custody is maintained, how custody is transferred, who are the individuals responsible.

   NOTE: A sample is considered in custody if it is in the person’s actual possession, is in view after being in physical possession, is locked so that no one can tamper with the sample after having been in physical custody, or is in a controlled area with access restricted to authorized personnel.

2. The following information is required, as a minimum, on the chain of custody protocol:

   - Hanford identification number or signature of sample collector
   - EDP/ABCASH location code for each sample
   - Unique sample number
   - Date and time of collection
• Hanford identification number or signatures of all individuals involved in sample transfer.

3. Chain of custody forms initiated should be protected from damage. This can be accomplished by placing the form in a plastic cover.

4. Chain of custody of all effluent samples (stack samples) is initiated at the time the sample is removed from the sampling system.

5. Chain of custody is documented on a Chain of Custody/Sample Analysis Request form or electronically via the ABCASH database.

The RCT should retain a copy of the chain of custody form(s) that documents custody from sampling until receipt at the MSC Sample Receiving. This form is retained at the facility per the established Records Retention Specifications, typically 5 years. (5.1.2.d)

3.6 Sample Collection Data
(5.1.2.d)

The sample collection data is recorded on the sample envelope or in the ABCASH database. All the portions of the envelope should be completed. Entries that are not applicable are noted with an “N/A.” Refer to TFC-ESHQ-RP_MON-P-02 (ABCASH) for recording entries into the ABCASH database. (5.1.2.a)

All sample collection data include the following, where appropriate:

• Sample “on” date
• Sample “off” date
• EDP code
• Hanford identification number or initials of collector
• Sample number (typically assigned by ABCASH)
• Sample flow data
• Sample beta and gamma reading survey results (on back of envelope). (5.1.2.b)

3.7 Sample Storage and Transportation

1. The following are required for sample storage and transportation.

• All samples should be transported to the MSC Sample Receiving as soon as practical.

• Samples are stored in access-controlled locations so that chain-of-custody protocols are maintained. (5.1.2.c)

• Samples are kept dry and at temperatures below 65.5°C (150 F) at all times. Temperatures greater than this might cause the material being sampled to melt or boil, resulting in a loss of the sample.

• Once placed in the sample envelope samples are not removed. This practice is intended to prevent damage and cross-contamination of samples.
2. Storage areas for samples are controlled to prevent damage or loss and to maintain sample integrity.

   NOTE: Even though samples are treated as radioactive materials, the sample might not meet Department of Transportation criteria for radioactive materials. Handling samples as radioactive materials ensures handling requirements specified in 10 CFR 835 and HNF-5183, “Tank Farms Radiological Control Manual,” are not violated, as samples are expected to contain some radioactivity. (5.1.4)

3. Samples are treated as radioactive materials until analysis proves otherwise.

3.8 Sample Flow Measurements

3.8.1 Instrumentation

Sample flow totalizing instruments are the preferred components used to measure sample volumes. A sample timer is required when sampling systems are not equipped with a flow totalizer.

Sample flow rate measurement devices should be accurate to within 10% of a reference standard.

3.9 Analytical Laboratories for Effluent Samples

The MSC is responsible for conducting, funding, and contracting analytical services for all airborne effluent sample analyses as documented in the Tank Operations Contract No. DE-AC27-08RV14800 Section J Interface 25. All airborne effluent samples are delivered to the MSA designated sample receiving location.

3.10 Sampling Particulate Radionuclides
(5.1.2.f)

Particulate radionuclides are extracted from the effluent stream and passed through a filter media that collects particulates. The filter must have a high efficiency for collection of submicron particles. The filter used is recommended by the MSC site-wide effluent monitoring program. Examples of acceptable filter media and manufacturers is provided in ANSI N13.1 – 1999 Table D-1.

Whenever possible, all individual particulate record samples should have a minimum sample volume of 566.4 cubic meters (20,000 cubic feet). This sample volume criterion is a data quality objective intended to meet the recommended minimum detectable concentration (MDC).

All 47-millimeter particulate sample filters are placed in a white air sample envelope (54-6700-206).

3.11 Sampling Gaseous and Volatile Radionuclides
(5.1.2.f-i)

Current radioactive air emissions licenses do not require sampling for gaseous or volatile radionuclides.
4.0 DEFINITIONS

No terms or phrases unique to this standard are used.

5.0 SOURCES

5.1 Requirements


   a. 61.12, “Compliance with Standards and Maintenance Requirements.”
   b. 61.14, “Monitoring Requirements.”
   c. 61.93, “Emission Monitoring and Test Procedures.”
   d. 61.95, “Recordkeeping Requirements.”
   e. 61.96, “Applications to Construct or Modify.”
   f. Appendix B, Method 114 2.1., “Radionuclides as Particulates.”
   g. Appendix B, Method 114 2.2.1., “The Radionuclide Tritium (H-3).”
   h. Appendix B, Method 114 2.2.2., “Radionuclides of Iodine.”
   i. Appendix B, Method 114 2.2.3., “Radionuclides of Argon, Krypton and Xenon.”

3. RPP-16922 Environmental Specifications Requirements


5.2 References

1. TF-REC-001 “Response to Environmental Condition.”

2. TF-OPS-005 “DST Daily CAM and Record Sampler Inspections.”

3. TF-OPS-033 “SST Daily CAM and Record Sampler Inspections.”


5. TFC-ESHQ-RP_MON-P-02, “Automated Bar Coding of Air Samples.”

6. TFC-OPS-OPER-C-60 “Surveillance Rounds.”