TSR Compliance

AN Farm Air Sample Filter Exchanges, Inspections and Source Checks of Stack and Annulus Effluent Record Samplers CAM(s)

Tank Farm Plant Operating Procedure

HEALTH PHYSICS

USQ # N/A-4

CHANGE HISTORY (≤ LAST 5 REV-MODS )

<table>
<thead>
<tr>
<th>Rev-Mod</th>
<th>Release Date</th>
<th>Justification</th>
<th>Summary of Changes</th>
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<tr>
<td>B-7</td>
<td>09/04/2018</td>
<td>Operations Request</td>
<td>Modified procedure to include changes involving VCZ transitions and implementation of APRs within AN Farm. Changes also include filter paper changes and RC categories while performing work.</td>
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<tr>
<td>B-6</td>
<td>10/04/2017</td>
<td>Inconsequential Change</td>
<td>Minor editorial changes to include changing the format of the Records Section</td>
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<tr>
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<td>09/07/2017</td>
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<td>Add TVIS, SEG 2 for non-running exhauster. Update/correct identifiers on ABCASH. Add specific detail for reset of HMI timer. Revise Exhaustor Totalized Parameter figure to specify CAM for one figure and RECORD SAMPLER for a new figure.</td>
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<tr>
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<td>05/02/2017</td>
<td>Update to wording of TFC-PLN-167</td>
<td>Modified White Label program statement in Section 3.1 to match recent changes to TFC-PLN-167. Step 4.3.2 corrected Format by adding First and Last to print name.</td>
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<td>Inconsequential change</td>
<td>Modified Record Section to option 2 from TF-OPS-OPER-STD-01 at request of document owner.</td>
</tr>
</tbody>
</table>

Table of Contents

1.0 PURPOSE AND SCOPE ........................................................................................................................................ 3

1.1 Purpose .................................................................................................................................................. 3

1.2 Scope ..................................................................................................................................................... 3

2.0 INFORMATION .............................................................................................................................................. 4

2.1 Terms and Definitions ............................................................................................................................... 4

2.2 General Information ............................................................................................................................... 4

3.0 PRECAUTIONS AND LIMITATIONS ........................................................................................................... 5

3.1 Personnel Safety ...................................................................................................................................... 5

3.2 Equipment Safety ..................................................................................................................................... 6

3.3 Radiation and Contamination Control ..................................................................................................... 6

3.4 Environmental Compliance ..................................................................................................................... 6

3.5 Limits ...................................................................................................................................................... 6

4.0 PREREQUISITES .......................................................................................................................................... 7

4.1 Special Tools, Equipment, and Supplies ................................................................................................ 7

4.2 Performance Documents ........................................................................................................................ 7

Type   Document No.   Rev/Mod   Release Date   Page
CONTINUOUS   TF-OPS-034   B-7     09/04/2018   1 of 46
AN Farm Air Sample Filter Exchanges, Inspections and Source Checks
of Stack and Annulus Effluent Record Samplers CAM(s)

4.3 Field Preparation ........................................................................................................... 8

5.0 PROCEDURE .................................................................................................................. 9

5.1 Use and Notifications ................................................................................................... 9

5.2 Quarterly Primary Exhaust System Radiation Source Check of HMI Exhauster AMS-4 CAMs ................................................................. 9

5.3 Primary Exhaust System Restore CAM to Service ...................................................... 16

5.4 Primary Exhauster Restoration ................................................................................... 18

5.5 Primary Exhaust System Exchange CAM Filter ......................................................... 19

5.6 Primary Exhaust System Exchange Record Sampler Air Sample Filter .................. 22

5.7 Quarterly Annulus Exhauster Radiation Source Check of AMS-4 Series CAMs ........ 25

5.8 Annulus Exhauster Restoration .................................................................................. 31

5.9 Annulus Exhaust System Exchange CAM Filter ......................................................... 33

5.10 Exchange Annulus Record Sampler Air Sample Filter .............................................. 35

5.11 Air Sample Exchange Completion ............................................................................. 36

5.12 Acceptance Criteria .................................................................................................... 36

5.13 Review .......................................................................................................................... 36

5.14 Records ........................................................................................................................ 37

Table 1 - Filter Change Intervals ...................................................................................... 38

Figure 1 - Sampling System .............................................................................................. 39

Figure 2 – AMS-4 CAM O-Ring Location ......................................................................... 40

Figure 3 – AN Farm Primary Ventilation Exhausters Screen .......................................... 41

Figure 4 - AN Exhauster Process Details Screen ............................................................... 42

Figure 5 - AN Exhauster Stack Sampler Screen ................................................................. 43

Figure 6 - AN Exhauster AMS-4 Screen ......................................................................... 44

Figure 7 – AN Exhauster Totalized CAM Sampler Readings .......................................... 45

Figure 8 - AN Exhauster Totalized Record Sampler Readings ......................................... 46
1.0 PURPOSE AND SCOPE

1.1 Purpose

This procedure provides instructions for performing source response checks and sample filter changes of CAMs installed on AN Farm Primary Ventilation HMI Controlled Exhausters and Annulus Ventilation Exhausters.

1.2 Scope

This procedure involves sample filter exchange, inspections and source checks of CAMs of Record Samplers for AN Farms as follows:

- RPP-16922, Environmental Specification Requirements,
- TFC-ESHQ-ENV-STD-05 Radioactive Airborne Effluent Sampling

<table>
<thead>
<tr>
<th>EDP Code</th>
<th>Stack Number</th>
<th>Location</th>
<th>Sample Type</th>
<th>EQID/EIN</th>
<th>PM Data Sheet</th>
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<tbody>
<tr>
<td>E903</td>
<td>296-A-30</td>
<td>241-AN Tank Annulus Exhaust</td>
<td>RAS</td>
<td>AN296-VTA-FLT-920</td>
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<tr>
<td>E920</td>
<td>296-A-44</td>
<td>241-AN A-Train Primary Tank Exhaust</td>
<td>RAS</td>
<td>AN241-VTP-FLT-553</td>
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<tr>
<td>E921</td>
<td>296-A-44</td>
<td>241-AN A-Train Primary Tank Exhaust</td>
<td>AMS-4 B CAM</td>
<td>AN241-VTP-RT-554</td>
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<td>E922</td>
<td>296-A-45</td>
<td>241-AN B-Train Primary Tank Exhaust</td>
<td>RAS</td>
<td>AN241-VTP-FLT-653</td>
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<tr>
<td>E923</td>
<td>296-A-45</td>
<td>241-AN B-Train Primary Tank Exhaust</td>
<td>AMS-4 B CAM</td>
<td>AN241-VTP-RT-654</td>
<td></td>
</tr>
</tbody>
</table>
2.0 INFORMATION

2.1 Terms and Definitions

- ABCASH: Automated Bar Coding of Air Sample at Hanford
- ASP: Alarm Set Point
- HCU: Handheld Computer Unit
- CFM: Cubic Feet per Minute (ft³/min, ft^3/min, ft³/min)
- SCFM: Standard Cubic Feet Per Minute (ft³/min, ft^3/min, ft³/min)
- Standard: (1 atm = 14.7psi, 68°F)
- RAS: Record Air Sampler
- URL: Upper Response Limit
- LRL: Lower Response Limit
- EQID: Equipment Identification (EIN).

2.2 General Information

2.2.1 AN-Farm uses 500 series numbers to identify their A-Train sampling components and 600 series to identify their B-Train sampling components. The EINs have AN241-VTP- prefix (See Figure 1).

2.2.2 When using the ABCASH system, it is not required to record sample information on the sample envelope or on the Sample Log.

2.2.3 Request for information steps where data has already been recorded may be skipped after verification of information.

2.2.4 Recording result on PM Data Sheet consist of circling Pass/Fail/NA or source used, checking or marking a check box, recording information or a combination.
3.0  PRECAUTIONS AND LIMITATIONS

3.1  Personnel Safety

3.1.1  IHT monitoring is required when source checking and/or exchanging primary stack samples.

3.1.2  Industrial Hygiene monitoring requirements will be specified in the Industrial Hygiene Sample Plan IHSP-EABO-11067.

3.1.3  Non-electrical worker accessing electrical enclosures must ensure the following:
   - The enclosure must have a white label indicating that it has been evaluated
   - The work activity within the enclosure does not involve:
     - Reaching around or moving electrical equipment
     - Contacting electrical connectors/connections
     - By-passing protective shielding/barriers.

3.1.3.1  Stop and notify management if these conditions cannot be met, or if discrepancies exist (e.g. conflicting or missing labels, missing or damaged protective barriers).

3.1.4  When environmental conditions exist where extreme cold or damp weather conditions could potentially cause condensation to form inside the ventilation system (outside ambient temperature is less than 50 degrees F and the exhauster has been shut down for longer than 30 minutes), absorbent materials should be placed around the filter paper connection when changing out filter paper. This will help to ensure liquids do not drip on electrical components/insulating barriers and maintains the electrically safe condition.
3.1 Personnel Safety (Cont.)

3.1.5 If liquids run down onto electrical components/insulating barriers, exit the cabinet. The cabinet must be reevaluated for electrical hazards.

3.1.6 When handling the absorbent materials, workers need to wear surgeons’ gloves.

3.2 Equipment Safety

CAUTION - To prevent cross contamination of record or CAM sample paper, paper should not be removed from proper envelope.

CAUTION - CAM Interlock BYPASS must be active or ventilation will shut down.

CAUTION - Failure to open applicable valve will result in no flow to CAM.

CAUTION - Failure to open applicable valve will result in no flow to Record Sampler.

3.3 Radiation and Contamination Control

3.3.1 When performed without a work package, this procedure is limited to radiological areas and work activities permitted by RWP.

3.4 Environmental Compliance

3.4.1 All planned and unplanned outages of Tank Farm ventilation systems, abatement control equipment, and exhaust monitoring systems must be reported to the applicable shift office per TF-REC-001.

3.5 Limits

RPP-16922, Environmental Specification Requirements

TFC-ESHQ-ENV-STD-05 Radioactive Airborne Effluent Sampling

NOTE – LCO 3.1 and LCO 3.4 (HNF-SD-WM-TSR-006) are only applicable to DST Primary Ventilation.

HNF-SD-WM-TSR-006, Tank Farms Technical Safety Requirements

- LCO 3.1, DST Primary Tank Ventilation Systems
- LCO 3.4, DST Induced Gas Release Event Flammable Gas Control.
4.0 PREREQUISITES

4.1 Special Tools, Equipment, and Supplies

The following supplies may be needed to perform this procedure:

- Calculator
- Sr-Y sealed Beta Source used during initial calibration (for AMS-4 CAMs)
- Replacement (versapor 47 mm) filter paper and envelope
- Tweezers for filter handling
- 2-way Portable/Handheld Radio
- Portable count rate survey instruments
- Key for Interlock Bypass Switch
- Small Screwdriver for cabinet access
- HCU for reading ABCASH bar code labels
- Surgeons’ Gloves
- Absorbant Material(s).

4.2 Performance Documents

The following additional documents may be needed to perform this procedure:

- Site Form A-6005-593, Respiratory Protection Form
- Site Form A-6003-962, Chain Of Custody/Sample Analysis Request
- PM Data Sheet, CAM Inspection and Source Checklist
- TFC-ESHQ_MON-P-02, Automated Bar Coding of Air Samples
- TO-060-106, Operate AN Tank Farm Primary Ventilation System (VTP)
- TF-OPS-005 DST Daily CAM and Record Sampler Inspections.
4.3 Field Preparation

4.3.1 PRIOR to performing this procedure, ENSURE Shift Manager is notified of work location and work scope.

4.3.2 Shift Manager/OE VERIFY that there are no ongoing transfers and no waste disturbing activities in AN Farm that requires this system to be OPERABLE and in operation. (LCO 3.4)

4.3.3 PREPARE a 47 mm sample filter and sample envelope for each exchange.

4.3.4 ENSURE RadCon personnel meet training requirements listed below:
- HPT initial qualification
- Orientation Checklist (Site Form A-6003-481)
- OJTs and following courses:
  - 356030, Eberline AMS-4 Beta CAM
  - 350979, Source Check and Air Sample Exchange
  - 351572, Daily CAM & Record Inspections
  - 356437, ABCASH.

4.3.5 ENSURE check sources used for CAMs have been identified by unique serial or identification numbers and have sufficient documentation to allow for determination of isotope and current activity level.

4.3.6 PRIOR to going to the field to perform Section 5.2 or 5.7, ENSURE required data from sources is documented in Block #1 on each PM Data Sheet.

4.3.7 RECORD the following from the current CAM calibration Data Sheet:
- Source Serial number
- Isotope
- Activity DPM.

4.3.8 MARK Initial and/or appropriate Quarterly Inspection on PM Data Sheet (Block #1).

4.3.9 IF performing this procedure on an Annulus Ventilation Stack Exhaust Ventilation System AMS-4 CAM, REQUEST presence of an operator to restart the ventilation system in the event the system shuts down due to a detector fail alarm on the CAM.
5.0 PROCEDURE

NOTE - Movement within individual sections may be performed simultaneously, in parallel or any logical order, unless otherwise noted in this procedure.

5.1 Use and Notifications

5.1.1 IF any item is identified as out-of-specification per referenced requirement(s), or in judgment of HPT an identified condition may render CAM inoperable, IMMEDIATELY NOTIFY Shift Manager of out-of-specification condition.

5.2 Quarterly Primary Exhaust System Radiation Source Check of HMI Exhauster AMS-4 CAMs

NOTE - Section 5.2 is performed on the Primary Ventilation System to satisfy source check requirements.

5.2.1 IMMEDIATELY NOTIFY Shift Manager to initiate time monitoring per LCO 3.1.A (for in-service train) of any unplanned primary exhauster shutdowns. (LCO 3.1)

5.2.2 CONFIRM Air sample filters are exchanged within the time frames indicated in Table 1.

5.2.2.1 IF Air Sample Filters are not exchanged within time frames, NOTIFY Shift Manager.

5.2.3 IF Exhauster is shutdown for planned outage, RECORD shutdown condition on PM Data Sheet.

Set up for Source Checks

5.2.4 PRESS [8] Key and RECORD as found CAM meter reading (cpm) on PM Data Sheet (Block #3).

5.2.5 ENSURE Shift Manager has been notified of location of CAM to be tested.

5.2.6 IF changing CAM filter paper is required, PERFORM section 5.5 AND

GO TO step 5.2.9.

5.2.7 OBTAIN Shift Manager permission to place CAM in bypass.
5.2 Quarterly Primary Exhaust System Radiation Source Check of HMI Exhauster AMS-4 CAMs (Cont.)

**CAUTION**

CAM Interlock BYPASS must be active or ventilation will shut down.

5.2.8 REQUEST operator to place stack CAM in Interlock BYPASS mode.

5.2.8.1 MONITOR “CAM Bypass Active” on corresponding Exhauster AMS-4 HMI screens, (See Figure 6 for help).

5.2.9 PERFORM the following to record applicable information on PM Data Sheet (Block #1):

5.2.9.1 RECORD date of inspection/source check.

5.2.9.2 IF the CAM Serial Number or Calibration due date on PM Data Sheet does not agree with the infield information, IMMEDIATELY NOTIFY Shift Manager.

5.2.10 RECORD Source Serial Number on PM Data Sheet (Block #1).

5.2.11 CHECK CAM is in service by observing the following:
- “READY” Light (Green) is lit
- “MALFUNCTION” Light (Amber) is not lit
- Red Beacon Light is not strobing
- Alarm Bell (or Horn) is not sounding.

5.2.12 IF CAM is not in service, IMMEDIATELY NOTIFY Shift Manager.

**NOTE** - Inspection Criteria may be performed in parallel for PM Data Sheet (Block #3).

- Record Sampler Flow rate is found on Totalized Parameters HMI screen (See Figure 7 for help).

5.2.13 RECORD As-Found “CAM SAMPLER” FLOW RATE (SCFM) on PM Data Sheet (Block #3).

5.2.14 IF As-Found Sample Flow Rate is not within acceptable range (1.9 to 2.1 scfm), NOTIFY Shift Manager.
5.2 Quarterly Primary Exhaust System Radiation Source Check of HMI Exhauster AMS-4 CAMs (Cont.)

5.2.15 **PERFORM** the following Steps to obtain As-Found CAM alarm setpoints:

5.2.15.1 **PRESS** the [Menu] key.

5.2.15.2 **ENTER** password “0000.”

5.2.15.3 **PRESS** the [Enter] key **AND**

**ENSURE** “INSTRUMENT STATUS” is displayed on display.

5.2.15.4 **PRESS** the [5] key **AND**

**ENSURE** the “ALARM PARAMETERS” is displayed on screen.

5.2.15.5 **PRESS** the [Enter] key once.

5.2.15.6 **PRESS** the [-] key to scroll from one to the next **AND**

**CHECK** following setpoints (As-Found):

- SLOW ALARM INTERVAL set to 60 minutes
- SLOW ALARM SETPOINT set to 300 dpm/ft³ ± 1 dpm/ft³
- FAST ALARM INTERVAL set to 60 seconds
- FAST ALARM SETPOINT set to 7000 dpm/ft³ ± 1 dpm/ft³
- NET ALARM INTERVAL set to 60 seconds
- NET ALARM SETPOINT set to 3000 cpm.

5.2.15.7 **RECORD** As-Found NET ALARM SETPOINT on CAM Source Check for PM Data Sheet (CAM Block #3).

5.2.16 **IF** any setpoints or intervals are at incorrect settings, **IMMEDIATELY NOTIFY** Shift Manager.
5.2 Quarterly Primary Exhaust System Radiation Source Check of HMI Exhauster AMS-4 CAMs (Cont.)

Source Check

5.2.17 PRESS the [Menu] key once AND

ENSURE “ALARM PARAMETERS” is displayed on screen.

5.2.17.1 PRESS [3] AND

ENSURE instrument parameters is displayed on screen.

5.2.17.2 PRESS [Enter] key.

5.2.17.3 PRESS [7] key AND

RECORD “Beta Efficiency” on PM Data Sheet (Block #1).

5.2.17.4 CALCULATE AND

RECORD lower and response limits (LRL & URL) on PM Data Sheet (Block #1).

5.2.17.5 PRESS [Menu] Key.

5.2.17.6 PRESS [9] key AND

ENSURE “Print Log Buffer” is displayed.

5.2.18 PRESS the [-] key AND

ENSURE “CALIBRATE” is displayed on screen.

5.2.19 PRESS the [Enter] key once.

5.2.20 UNTIL “SOURCE CHECK” is displayed on screen, PRESS the [-] key.

NOTE - Screen will scroll message “Remove all Sources for Background Reading” when alarm functions are disabled.

5.2.21 PRESS the [Enter] key twice to disables all alarm functions.
5.2 Quarterly Primary Exhaust System Radiation Source Check of HMI Exhauster AMS-4 CAMs (Cont.)

5.2.22 IF Train is running, CLOSE valve V-554 for A-Train OR V-654 for B-Train

5.2.23 IF Section 5.5 was NOT PERFORMED THEN

PERFORM the following:

5.2.23.1 PERFORM IHT monitoring as per IHSP-EABO-11067.

5.2.23.2 OPEN sample holder slowly in preparation for removal of CAM filter.

5.2.23.3 REMOVE Cam filter paper.

5.2.23.4 SAVE CAM filter paper for reinstallation.

5.2.23.5 INSTALL a new clean filter paper on the unit with the smooth side up and centered on the O-ring.

5.2.23.6 CLOSE sample holder AND

ENSURE holder is latched.

5.2.24 PRESS the [Enter] key once to initiate background radiation count (300 second).

NOTE - Section 5.6 may be performed in parallel with Step 5.2.25.

5.2.25 CONFIRM background counting period is 300 seconds.

5.2.25.1 IF counting period is not 300 seconds, NOTIFY Shift Manager.

5.2.26 WHEN background radiation count is completed, RECORD background count rate on PM Data Sheet (Block #2) AND

PRESS the [Enter] key once.
5.2 Quarterly Primary Exhaust System Radiation Source Check of HMI Exhauster AMS-4 CAMs (Cont.)

NOTE - Inspection Criteria may be performed in parallel for PM Data Sheet (Block #3).

5.2.27 **ENSURE** serial number of source used, Isotope, activity (DPM) is on PM Data Sheet (Block #1).

5.2.28 **PERFORM** IHT monitoring as per IHSP-EABO-11067

5.2.29 **OPEN** sample holder.

5.2.30 **REMOVE** clean filter paper.

5.2.31 **INSERT** check source in place of filter paper.

5.2.32 **CLOSE** sample holder **AND**

**ENSURE** holder is latched.

5.2.33 **PRESS** the [Enter] key once to initiate source check (300 seconds).

NOTE - Data in Step 5.2.34 represents the instruments current system %Efficiency and %Efficiency Differential.

5.2.34 **WHEN** source check completes, **PERFORM** the following on PM Data Sheet:

5.2.34.1 **RECORD** %Efficiency (EFF) and %Efficiency Differential (EFF DIFF) on PM Data Sheet (Block #2).

5.2.34.2 **COMPARE** EFF with response limits (LRL & URL) on PM Data Sheet.

5.2.34.3 **RECORD** results of comparison (Pass/Fail) on PM Data Sheet (Block #2).

5.2.35 **IF** EFF is within established response range, **GO TO** Section 5.3.
5.2 Quarterly Primary Exhaust System Radiation Source Check of HMI Exhauster AMS-4 CAMs (Cont.)

**Source Re-Check**

5.2.36 IF EFF on first source check is not within response limits, **PERFORM** the following:

5.2.36.1 **OPEN** sample holder.

5.2.36.2 **REMOVE** check source.

5.2.36.3 **INSTALL** a new clean filter paper on the unit with the smooth side up **AND**

**CENTERED** on the O-ring.

5.2.36.4 **CLOSE** sample holder **AND**

**ENSURE** holder is latched.

5.2.36.5 **PRESS** the [Menu] key once.

5.2.37 **NOTIFY** shift manager if background counting period is NOT 300 seconds **AND**

**REPEAT** Steps 5.2.26 through 5.2.35.

5.2.38 IF EFF of check source is not within response limits, **PERFORM** the following:

5.2.38.1 **RECORD** source check unsat on PM Data Sheet (Block #4).

5.2.38.2 **IMMEDIATELY NOTIFY** Shift Manager of CAM source check failure and that time monitoring may apply.

5.2.39 **GO TO** Section 5.3.
5.3 Primary Exhaust System Restore CAM to Service

NOTE - Inspection Criteria may be performed in parallel for PM Data Sheet (Block #3).

**Restore CAM to Service**

5.3.1 **AFTER** check source count is completed, **REMOVE** check source.

5.3.2 **INSPECT** O-Rings (see Figure 2).

5.3.3 **INSPECT** CAM detector for cleanliness.

5.3.4 **ENSURE** CAM filter backing is in place.

5.3.5 **INSTALL** original sample filter or a new sample filter from Section 5.5.

5.3.6 **CLOSE** sample holder **AND**

**ENSURE** holder is latched.

**CAUTION**

Failure to open applicable valve will result in no flow to CAM.

5.3.7 **IF** Train is running, **OPEN** valve V-554 for A-Train OR V-654 for B-Train.

**NOTE** Screen will quickly display normal operating mode.

5.3.8 **PRESS** the [Menu] key on AMS-4 three times to put system back in service.

5.3.8.1 **IF** system does not return to service, **NOTIFY** Shift Manager to request Maintenance reset CAM.

5.3.9 **AFTER** “READY” Green Light is lit, **ACKNOWLEDGE/RESET** alarms (may take up to 5 minutes).

**NOTE** - AMS-4 CAM always displays 2.0 CFM as a fixed value and should be ignored during testing. Only the HMI provided value is correct.

5.3.10 **OBTAIN** “CAM SAMPLER” flow rate from Exhauster AMS-4 HMI screen (See Figure 8).

**NOTE** If flow is out of tolerance, HMI may be in manual mode.

5.3.10.1 **ENSURE** CAM Sampler (scfm) Value is within 1.9 to 2.1 scfm.

5.3.10.2 **RECORD** As-Left CAM flow on PM Data Sheet (Block #3).
5.3 **Primary Exhaust System Restore CAM to Service (Cont.)**

5.3.10.3 **NOTIFY** Shift Manager **IF** CAM SAMPLER (SCFM) value is out of range.

5.3.11 **PRESS** the [9] and/or [-] key **AND**

**ENSURE** ‘instrument status normal” is displayed on screen.

5.3.12 **PRESS** the [8] key **AND**

**RECORD** as-left CAM meter reading (cpm) on PM Data Sheet (Block #3)

**NOTE** CAM ASP is top line of display

5.3.13 **PRESS** the [7] key **AND**

**RECORD** as left net alarm setpoint on PM Data Sheet (Block #3)

5.3.14 **PRESS** the [9] and/or [-] key **AND**

**ENSURE** ‘instrument status normal” is displayed on screen.

5.3.15 **CHECK** CAM is in service by observing the following:

- “READY” Light (Green) is LIT
- “MALFUNCTION” Light (Amber) is not LIT
- Red Beacon Light is not strobing
- Alarm Bell (or Horn) is not sounding.

5.3.16 **CHECK** CAM outlet pressure PI-554 for A-Train or PI-654 for B-Train is ≤ 11 in. Hg (See Figure 1).

5.3.16.1 **IF** CAM outlet pressure PI-554/PI-654 is greater than 11 in. Hg, **NOTIFY** Shift Manager.

5.3.17 **COMPLETE** inspection criteria Block #3 on PM Data Sheet **AND**

**COMPLETE** system(s) status for Block #4 on PM Data Sheet.

5.3.18 **GO TO** Section 5.4.
5.4 Primary Exhauster Restoration

5.4.1 IF CAM source check and/or CAM filter exchange was performed, PERFORM the following:

5.4.1.1 REQUEST Shift Manager permission to return stack CAM Interlock Bypass to inactive.

5.4.1.2 REQUEST Operator to clear/reset all alarms including RAH 554/654.

5.4.1.3 REQUEST Operator place CAM Interlock Bypass to normal.

5.4.1.4 NOTIFY Shift Manager stack CAM Interlock Bypass has been returned to inactive.

5.4.1.5 IMMEDIATELY NOTIFY Shift Manager of the following:
- Test has been completed
- CAM/RECORD SYSTEM STATUS: RETURNED TO SERVICE or OUT OF SERVICE.

5.4.2 IF CAM filter exchange was performed, GO TO Section 5.11 otherwise GO TO Section 5.12.
5.5 Primary Exhaust System Exchange CAM Filter

5.5.1 IF system is found out of service, NOTIFY Shift Manager.

5.5.2 ENSURE Shift Manager has been notified of this Air Sample Exchange.

5.5.3 RECORD Date and Electronic Data Processing (EDP) code along outside edge of CAM filter paper.

5.5.4 IF during CAM filter exchange the exhaust stack shuts down, IMMEDIATELY NOTIFY Shift Manager that system has shut down and initiate time monitoring per LCO 3.1.A. (LCO 3.1)

5.5.5 REQUEST Shift Manager permission to bypass CAM interlocks AND PERFORM the following:

**CAUTION**
CAM Interlock BYPASS must be active or ventilation will shut down.

5.5.5.1 REQUEST Operator to place stack CAM in Interlock BYPASS.

5.5.5.2 CHECK “CAM Bypass Active” on corresponding Exhauster AMS-4 HMI screens, (See Figure 6 for help).

5.5.6 RECORD required sample As-Found (Off Data) information (Date, Sample Flow Rate, CAM Sampler Lifetime Total Flow) on brown sample envelope or in ABCASH HCU. (See Figure 7)

<table>
<thead>
<tr>
<th>HMI Screen</th>
<th>ABCASH</th>
</tr>
</thead>
<tbody>
<tr>
<td>CAM Sampler Total Flow - Lifetime</td>
<td>Gasmeter</td>
</tr>
<tr>
<td></td>
<td>Cu Ft</td>
</tr>
<tr>
<td>CAM Sampler Total Runtime -Current</td>
<td>Timer</td>
</tr>
<tr>
<td></td>
<td>Hrs</td>
</tr>
<tr>
<td>CAM Sampler (scfm)</td>
<td>Rotameter</td>
</tr>
<tr>
<td></td>
<td>Cu Ft/Min</td>
</tr>
</tbody>
</table>

5.5.7 IF Train is running, CLOSE valve V-554 for A-Train OR V-654 for B-Train.

5.5.8 PERFORM IHT monitoring as per IHSP-EABO-11067.
5.5 Primary Exhaust System Exchange CAM Filter (Cont.)

5.5.9 OPEN sample holder.

5.5.10 IF open door alarm actuates, ACKNOWLEDGE alarm.

5.5.11 REMOVE filter AND

NOTE - Resetting HMI timer may require special login (from Shift Manager/Engineering).

5.5.12 RESET HMI timer “CAM Sampler Total Runtime Current” on corresponding Exhauster HMI screen (see Figure 7 for help).

5.5.12.1 CLICK [RESET] button.

5.5.12.2 CLICK on Enter . (See Figure 7)

5.5.12.1 IF unable to reset HMI timer, NOTIFY Shift Manager.

5.5.13 INSPECT O-Rings (see Figure 2).

5.5.13.1 IF O-Rings are found to be damaged, CONTACT Shift Manager.

5.5.14 PLACE a new clean filter paper on the unit with the smooth side up AND CENTERED on the O-ring.

5.5.15 CLOSE sample holder AND

ENSURE holder is latched.

CAUTION

Failure to open applicable valve will result in no flow to CAM.

5.5.16 IF Train is running, OPEN valve V-554 for A-Train OR V-654 for B-Train.

5.5.17 AFTER “READY” Green Light is lit (may take up to 5 minutes), ACKNOWLEDGE/RESET actuated alarms.
5.5 Primary Exhaust System Exchange CAM Filter (Cont.)

5.5.18 **ENSURE** Sample Airflow is correct 1.9 to 2.1 scfm.

5.5.19 **RECORD** required sample As- Left Flow Rate and Total Flow (On Data) information on brown sample envelope or in ABCASH HCU.

<table>
<thead>
<tr>
<th>HMI Screen</th>
<th>ABCASH</th>
</tr>
</thead>
<tbody>
<tr>
<td>CAM Sampler Total Flow - Lifetime</td>
<td>Gasmeter, Cu Ft</td>
</tr>
<tr>
<td>CAM Sampler (scfm)</td>
<td>Rotameter, Cu Ft/Min</td>
</tr>
</tbody>
</table>

5.5.20 **CHECK** CAM outlet pressure PI-554 for A-Train or PI-654 for B-Train is \( \leq 11 \) in. Hg.

5.5.20.1 **IF** CAM outlet pressure PI-554 for A-Train or PI-654 for B-Train is greater than 11 in. Hg, **NOTIFY** Shift Manager.

5.5.21 **RETURN** to Section 5.2

**OR**

**GO TO** Section 5.4.
5.6 Primary Exhaust System Exchange Record Sampler Air Sample Filter

5.6.1 IF during sample filter exchange the exhaust stack shuts down, IMMEDIATELY NOTIFY Shift Manager that system has shut down and initiate time monitoring per LCO 3.1.A. (LCO 3.1)

5.6.2 CONFIRM Air sample filters are exchanged within the time frames indicated in Table 1.

5.6.2.1 IF Air Sample Filters are not exchanged within time frames, NOTIFY Shift Manager.

5.6.3 IF system is found out of service, NOTIFY Shift Manager.

5.6.4 ENSURE Shift Manager has been notified of this Air Sample Exchange.

5.6.5 RECORD Date and Electronic Data Processing (EDP) code along outside edge of Air Sample filter paper.

5.6.6 RECORD the following sample As-Found (Off Data) information on white sample envelope or in ABCASH HCU (See Figure 8 for screen help):

<table>
<thead>
<tr>
<th>HMI Screen</th>
<th>ABCASH</th>
</tr>
</thead>
<tbody>
<tr>
<td>Record Sampler Total Flow – Lifetime</td>
<td>Gasmeter Cu Ft</td>
</tr>
<tr>
<td>Record Sampler Total Runtime – Current</td>
<td>Timer Hrs</td>
</tr>
<tr>
<td>Record Sampler (scfm)</td>
<td>Rotameter Cu Ft/Min</td>
</tr>
<tr>
<td>Stack Flow Total Flow – Lifetime</td>
<td>Stack Cu Ft</td>
</tr>
</tbody>
</table>

5.6.7 IF Train is running, CLOSE valve V-553 for A-Train OR V-653 for B-Train.

5.6.8 PERFORM IHT monitoring as per IHSP-EABO-11067.

5.6.9 REMOVE record sample filter.
5.6 Primary Exhaust System Exchange Record Sampler Air Sample Filter (Cont.)

CAUTION
To prevent cross contamination of record or CAM sample paper, paper should not be removed from proper envelope.

5.6.10 INSERT record sample filter into white sample envelope AND DO NOT REMOVE Record Sample filter from white envelope.

5.6.11 IF record sample filter is wet or damaged, NOTIFY Shift Manager.

NOTE - Resetting HMI timer may require special login (from Shift Manager/Engineering).

5.6.12 RESET HMI timer “Record Sampler Total Runtime Current” on corresponding Exhauster HMI screen (see Figure 8 for help).

5.6.12.1 CLICK [RESET] button.

5.6.12.2 CLICK on Enter. (See Figure 8)

5.6.12.3 IF unable to reset HMI timer, NOTIFY Shift Manager.

5.6.13 INSPECT rubber gasket(s) and filter screen.

5.6.13.1 IF rubber gasket(s) or filter screen is found to be damaged, CONTACT Shift Manager.

5.6.14 INSTALL new sample filter in sample holder AND RE-ASSEMBLE.
5.6 Primary Exhaust System Exchange Record Sampler Air Sample Filter (Cont.)

**CAUTION**

Failure to open applicable valve will result in no flow to Record Sampler.

5.6.15 **IF** Train is running, **OPEN** valve V-553 for A-Train OR V-653 for B-Train.

**NOTE** - If flow is out of tolerance, Flow Control Valve (FCV) on HMI may be in manual mode. Adjustments to Auto Mode are made on the Stack Sampler screen. (See Figure 5)

5.6.16 **ENSURE** Record Sampler flow rate is correct ± 10% of stack flow/1000 scfm (See Figure 4).

5.6.17 **RECORD** the following sample (on Data) information on white sample envelope or in ABCASH HCU (See Figure 8 for screen help).

<table>
<thead>
<tr>
<th>HMI Screen</th>
<th>ABCASH</th>
</tr>
</thead>
<tbody>
<tr>
<td>Record Sampler Total Flow – Lifetime</td>
<td>Gasmeter Cu Ft</td>
</tr>
<tr>
<td>Record Sampler (scfm)</td>
<td>Rotameter Cu Ft/Min</td>
</tr>
<tr>
<td>Stack Flow Total Flow – Lifetime</td>
<td>Stack Cu Ft</td>
</tr>
</tbody>
</table>

5.6.18 **CHECK** outlet pressure PI-553 for A-Train or PI-653 for B-Train is ≤ 11 in. Hg (See Figure 1).

5.6.18.1 **IF** outlet pressure PI-553/PI-653 is greater than 11 in. Hg, **NOTIFY** Shift Manager.

5.6.19 **GO TO** Section 5.11.
5.7 Quarterly Annulus Exhauster Radiation Source Check of AMS-4 Series CAMs

NOTE - Performance of this Section will require the AMS-4 to be out of service for a minimum of 30 minutes.

5.7.1 IF during the performance of this procedure there is an unplanned exhauster shutdown, IMMEDIATELY NOTIFY Shift Manager.

5.7.2 IF Exhauster is shutdown for planned outage, RECORD shutdown condition on PM Data Sheet.

Set up for Source Check

5.7.3 ENSURE Shift Manager has been notified of location of CAM to be tested.

5.7.4 PRESS the [8] key and RECORD as found CAM meter reading (cpm) on PM Data Sheet (Block #3)

5.7.5 IF Changing CAM filter paper is required, PERFORM section 5.9.

5.7.6 PERFORM the following to record applicable information on PM Data Sheet (Block #1):

5.7.6.1 RECORD date of inspection/source check.

5.7.6.2 IF the CAM Serial Number or Calibration due date on PM Data Sheet does not agree with the infield information, IMMEDIATELY NOTIFY Shift Manager.

5.7.7 CHECK CAM is in service by observing the following:

- "READY" Light (Green) is lit
- "MALFUNCTION" Light (Amber) is not lit
- Red Beacon Light is not strobing
- Alarm Bell (or Horn) is not sounding.

5.7.8 IF CAM is not in service, IMMEDIATELY NOTIFY Shift Manager.
5.7 Quarterly Annulus Exhauster Radiation Source Check of AMS-4 Series CAMs (Cont.)

5.7.9 PERFORM the following Steps to obtain CAM flow rate:

NOTE - Inspection Criteria may be performed in parallel for PM Data Sheet (Block #3).

5.7.9.1 PRESS the [2] key.

5.7.9.2 RECORD "As-Found" "SAMPLE FLOW RATE" FT3/MIN under CAM flow (cfm) on PM Data Sheet (Block #3).

5.7.10 IF "As-Found" Flow Rate is not within acceptable range specified (1.8 to 2.2 scfm), IMMEDIATELY NOTIFY Shift Manager.

5.7.11 PERFORM the following Steps to obtain "As-Found" CAM alarm setpoints:

5.7.11.1 PRESS the [Menu] key.

5.7.11.2 ENTER password “0000”.

5.7.11.3 PRESS the [Enter] key AND

ENSURE "INSTRUMENT STATUS" is displayed on screen.

5.7.11.4 PRESS the [5] key AND

ENSURE the"ALARM PARAMETERS" is displayed,

5.7.11.5 PRESS the [Enter] key once.

5.7.11.6 PRESS the [-] key to scroll from one to the next AND

CHECK the following setpoints ("As-Found"):
- SLOW ALARM INTERVAL set to 60 minutes
- SLOW ALARM SETPOINT set to 300 dpm/ft³
- FAST ALARM INTERVAL set to 60 seconds
- FAST ALARM SETPOINT set to 7000 dpm/ft³
- NET ALARM INTERVAL set to 60 seconds
- NET ALARM SETPOINT set 3000 cpm.

5.7.11.7 RECORD "As-Found" "NET ALARM SETPOINT” on CAM Source Check for PM Data Sheet (Block #3).
5.7 Quarterly Annulus Exhauster Radiation Source Check of AMS-4 Series CAMs (Cont.).

5.7.12 IF any setpoints or intervals are at incorrect settings, IMMEDIATELY NOTIFY Shift Manager.

Source Check

5.7.13 PRESS the [Menu] key once AND

ENSURE “ALARM PARAMETERS” is displayed on screen.

5.7.13.1 PRESS [3] AND

ENSURE instrument parameters is displayed on screen.

5.7.13.2 PRESS [Enter] key.

5.7.13.3 PRESS [7] key AND

RECORD “Beta Efficiency” on PM Data Sheet (Block #1).

5.7.13.4 CALCULATE AND

RECORD lower and response limits (LRL & URL) on PM Data Sheet (Block #1).

5.7.13.5 PRESS [Menu] Key.

5.7.13.6 PRESS [9] key AND

ENSURE “Print Log Buffer” is displayed on screen.

5.7.14 PRESS the [-] key AND

ENSURE "Calibrate" is displayed on screen.

5.7.15 PRESS the [Enter] key once.

5.7.16 UNTIL “Source Check” is displayed on screen, PRESS the [-] key.

5.7.17 PRESS the [Enter] key twice to disables all alarm functions.

5.7.18 POSITION vacuum motor ON/OFF switch to OFF.
5.7 Quarterly Annulus Exhauster Radiation Source Check of AMS-4 Series CAMs (Cont.).

5.7.19 IF Section 5.9 was NOT performed then PERFORM the following:

5.7.19.1 OPEN the sample holder.

5.7.19.2 REMOVE CAM filter paper.

5.7.19.3 SAVE CAM filter paper for reinstallation.

5.7.19.4 INSTALL a new clean filter paper on the unit with the smooth side up AND CENTERED on the O-ring.

5.7.19.5 CLOSE sample holder AND ENSURE holder is latched.

5.7.20 PRESS the [Enter] key once to initiate background radiation count (300 second count).

NOTE - Section 5.10 may be performed in parallel with Step 5.7.21.

5.7.21 CONFIRM background counting period is 300 seconds.

5.7.21.1 IF counting period is not 300 seconds, NOTIFY Shift Manager.

5.7.22 WHEN background radiation count is completed, RECORD background count rate on PM Data Sheet (Block #2) AND PRESS the [Enter] key once.

NOTE - Inspection Criteria may be performed in parallel for PM Data Sheet (Block #3).

5.7.23 ENSURE serial number of source used, isotope, activity (DPM), is on PM Data Sheet (Block #1).

5.7.24 OPEN sample holder.

5.7.25 REMOVE clean filter paper.

5.7.26 INSERT check source in place of filter paper.
5.7 Quarterly Annulus Exhauster Radiation Source Check of AMS-4 Series CAMs (Cont.).

5.7.27 CLOSE sample holder AND

ENSURE holder is latched.

5.7.28 PRESS the [Enter] key once to initiate the source check (300 seconds).

5.7.29 WHEN source check completes, PERFORM the following on PM Data Sheet:

5.7.29.1 RECORD %Efficiency (EFF) and %Efficiency Differential (EFF DIFF) on PM Data Sheet (Block #2).

5.7.29.2 COMPARE EFF with response limits (LRL & URL) on PM Data Sheet.

5.7.29.3 RECORD results of comparison, Pass/Fail, on PM Data Sheet (Block #2).

5.7.30 IF EFF is within established response range, GO TO Section 5.8.

Source Re-Check

5.7.31 IF EFF on first source check is not within response limits, PERFORM the following:

5.7.31.1 REMOVE check source.

5.7.31.2 INSTALL a new clean filter paper on the unit with the smooth side up AND

CENTERED on the O-ring.

5.7.31.3 CLOSE sample holder AND

ENSURE holder is latched.

5.7.31.4 PRESS the [menu] key once.

5.7.31.5 PRESS the [Enter] key 3 times to initiate the background radiation count (300 second count).

5.7.31.6 REPEAT Steps 5.7.23 through 5.7.30 once.
5.7 Quarterly Annulus Exhauster Radiation Source Check of AMS-4 Series CAMs (Cont.).

5.7.32 IF check source is not within response limits, **PERFORM** the following:

5.7.32.1 **RECORD** source check UNSAT on PM Data Sheet (Block #4).

5.7.32.2 **NOTIFY** Shift Manager.

5.7.32.3 **GO TO** Section 5.8.
5.8 Annulus Exhauster Restoration

NOTE  Inspection Criteria may be performed in parallel for PM Data Sheet (Block #3).
This Section only applies if Section 5.7 was performed.

**Restore CAM to Service**

5.8.1  **AFTER** check source count is completed, **REMOVE** check source.

5.8.2  **INSPECT** O-Rings (see Figure 2).

5.8.3  **INSPECT** CAM Detector for cleanliness.

5.8.4  **INSTALL** original sample filter or a new sample filter from Section 5.9 **AND**

**CLOSE** detector door.

5.8.5  **PRESS** the [Menu] key on AMS-4 three times to put system back in service.

5.8.5.1  **IF** system does not return to service, **NOTIFY** Shift Manager to request Maintenance reset CAM.

5.8.6  **AFTER** “READY” Green Light is lit, **ACKNOWLEDGE/RESET** alarms (may take up to 5 minutes).

5.8.7  **POSITION** vacuum motor switch to “ON”

5.8.8  **PRESS** the [9] key **AND**

**ENSURE** ‘instrument status normal” is displayed on screen.

**NOTE**  CAM ASP is top line of display.

5.8.9  **PRESS** the [7] key **AND**

**RECORD** as left net alarm setpoint on PM Data Sheet (Block #3)

5.8.10  **PRESS** the [9] key **AND**

**ENSURE** ‘instrument status normal” is displayed on screen.
5.8 Annulus Exhauster Restoration (Cont.)

5.8.11 CHECK CAM is in service by observing the following:
- “READY” Light (Green) is lit
- “MALFUNCTION” Light (Amber) is not lit
- Red Beacon Light is not strobing
- Alarm Bell (or Horn) is not sounding.

5.8.12 COMPLETE inspection criteria Block #3 on PM Data Sheet AND COMPLETE system(s) status Block #4 on PM Data Sheet.
5.9  Annulus Exhaust System Exchange CAM Filter

NOTE - The CAMs may be installed with electrical interlocks and relays that, if alarmed or overridden, can shut down the exhaust and detection systems.

5.9.1 ENSURE Shift Manager has been notified of this Air Sample Exchange.

5.9.2 RECORD EDP code and date along outside edge of CAM filter paper.

5.9.3 IF CAM is alarming, NOTIFY Shift Manager AND RECORD in Radiological Control log.

5.9.4 IF during sample exchange the exhaust stack shuts down, IMMEDIATELY NOTIFY Shift Manager that system has shut down.

5.9.5 RECORD required sample "OFF" information on brown sample envelope or ABCASH HCU.

NOTE - For an AMS-4 CAM, the following step will reset the history files and inhibit alarm monitoring until sufficient new history is obtained as indicated by the "READY" light. This also allows time for proper O-Ring inspection. Collection of new history will not occur and the alarm will remain active until the filter door is closed.

5.9.6 ACKNOWLEDGE alarm that occurs when filter door is opened.

5.9.7 REMOVE CAM filter.

5.9.8 INSERT CAM filter into a brown sample envelope.

5.9.9 INSPECT O-ring(s) AND

IF O-ring(s) are found to be damaged or missing, NOTIFY Shift Manager of O-ring condition.

5.9.10 ENSURE air sample filter holder and screens are in place and in good condition.

5.9.11 INSTALL a new sample filter in the sample holder and reassemble.

5.9.12 AFTER installing new filter, ENSURE flow rate is within the range(s) of 1.8 to 2.2 cfm.
5.9 Annulus Exhaust System Exchange CAM Filter (Cont.)

5.9.13 RECORD required sample "ON" information on brown envelope #54-6700-205 or ABCASH HCU for next sample exchange.

NOTE “Ready” green light may take up to five minutes to light up.

5.9.14 AFTER "READY" green light is lit, ACKNOWLEDGE/RESET actuated alarms.

5.9.15 IF Performing Source Check return to Section 5.7.

OR

GO TO Section 5.11.
5.10 Exchange Annulus Record Sampler Air Sample Filter

5.10.1 IF system is found out of service, NOTIFY Shift Manager.

5.10.2 ENSURE Shift Manager has been notified of this Air Sample Exchange.

5.10.3 RECORD Electronic Data Processing (EDP) code and date along the outside edge of Record Air Sample.

5.10.4 IF during sample exchange the exhaust stack shuts down, IMMEDIATELY NOTIFY Shift Manager that system has shut down.

5.10.5 RECORD required sample "As-Found" (Off Data) information on white sample envelope or in ABCASH HCU.

5.10.6 REMOVE the record sample filter.

5.10.7 IF the record sample filter is wet or damaged, NOTIFY Shift Manager.

5.10.8 INSERT record sample filter into a white sample envelope AND DO NOT REMOVE record sample filter.

5.10.9 INSTALL a new sample filter in the sample holder AND RE-ASSEMBLE.

5.10.10 RESET Record Sample Timer.

5.10.11 IF flow rate is out tolerance, ADJUST flow (108 to 132 scfh).

5.10.12 IF record sample flow rate cannot be adjusted within range, NOTIFY Shift Manager.

5.10.13 RECORD “on data” on sample envelope or on ABCASH HCU.

5.10.14 GO TO Section 5.11.
### 5.11 Air Sample Exchange Completion

**NOTE**  This section applies to all Air Sample Exchanges performed using this procedure.

#### 5.11.1 IF Air Sample Exchange was performed, **PERFORM** this section. IF Air Sample Exchange was NOT performed **GO TO** Section 5.12.

- **5.11.1.1** IF ABCASH system is not operable, **COMPLETE** Site Form A-6003-963 CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST.

- **5.11.1.2** IF ABCASH operable **PERFORM** the following:
  a. **TRANSFER** Data to ABCASH Database.
  b. **COMPLETE** CHAIN OF CUSTODY in ABCASH.

- **5.11.1.3** **DELIVER** samples to approved facility sample storage area.

### 5.12 Acceptance Criteria

- **5.12.1** **CHECK** Sections performed have been completed and systems/components performed as specified.

### 5.13 Review

**NOTE**  If only performing Air Sample Exchange then PM Data Sheet is not required.

- **5.13.1** IF PM Data Sheet was used to complete this procedure, **PERFORM** the following:
  - **5.13.1.1** **ENSURE** all deficiencies identified have been noted on PM Data Sheet and red circled.
  - **5.13.1.2** **COMPLETE** and sign PM Data Sheet.
  - **5.13.1.3** **FORWARD** completed PM Data Sheet to Radiological Control First Line Manager for review.
5.14 Records

5.14.1 **PERFORM** the following for records identified within this procedure.

5.14.1.1 **RECORD** the number of times the record was generated in applicable column

**OR**

5.14.1.2 **SUBMIT** the package to FWS/OE/Shift Manager after review and approval.

<table>
<thead>
<tr>
<th>Records Submittal Checklist</th>
<th>Number of times completed</th>
<th>N/A (✓)</th>
</tr>
</thead>
</table>

**4.3 Field Preparation**

Step 4.3.2

FWS/OE/Shift Manager **SEND** the completed records to the Central Shift Office for records retention.

____________________________________ / ___________________________________ / ______________________

Signature Print (First & Last) Date

FWS/OE/Shift Manager

The record custodian identified in the Company Level Record Inventory and Disposition Schedule (RIDS) is responsible for record retention in accordance with TFC-BSM-IRM_DC-C-02.
Table 1 - Filter Change Intervals

<table>
<thead>
<tr>
<th>Location</th>
<th>Minimum</th>
<th>Normal</th>
<th>Maximum</th>
</tr>
</thead>
<tbody>
<tr>
<td>HMI - Controlled Exhausters</td>
<td>168 hours (7 days) * or 20,000 cubic feet (566.4 cubic meters)</td>
<td>504 hours (21 days)</td>
<td>720 hours (30 days)</td>
</tr>
</tbody>
</table>

* Contact Environmental if filter exchange is required within less than minimum required hours of service.
Figure 1 - Sampling System

A-TRAIN

B-TRAIN

NOTE: Equipment EIN preceded by AN 241-VTP- or AW 241-VTP-
Figure 2 – AMS-4 CAM O-Ring Location

This is an example of where O-rings are located. Each system may vary slightly in appearance.
NOTE - AN and AW have identical screens.

[1] CLICK on Exhauster A or Exhauster B button to navigate to the Exhauster Process Details screen to get to Exhauster Process Details screen.
NOTE - AN and AW have identical screens.

[1] **OBTAIN** Stack Flow from the Instrument shown above.

[2] **CLICK** on the “Stack Sampler” button shown above to go to Exhauster Sampler screen.
AN and AW have identical screens.

[1] CLICK on the AMS-4 button to access Exhauster AMS-4 screen.
Figure 6 - AN Exhauster AMS-4 Screen

NOTE - AN and AW have identical screens.
NOTE  Screen will say CAM Bypass Active when engaged.

[1] **OBTAIN** the following from this screen;
- CAM Serial Number
- CAM Sample Flow
- Record Sample Flow
- Stack Release Rate
- “CAM Bypass Inactive” when not engaged CAM Bypass Active” when engaged.

[2] **CLICK** Totalizer button from AMS-4 Screen to get to Exhauster Totalized Parameters screen.
Figure 7 – AN Exhauster Totalized CAM Sampler Readings

NOTE - AN and AW have identical screens.
NOTE - AN and AW have identical screens.