Perform Portable Exhauster POR06 (Skid D) CAM Alarm/Interlock Functional Check

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1.0 PURPOSE AND SCOPE

1.1 Purpose

To provide instructions to perform a functional check of Portable Exhauster POR06 (Skid D) Continuous Air Monitor (CAM) alarm/interlock.

1.2 Scope

1.2.1 This procedure covers functionally checking the POR06 Exhaust Stack Continuous Air Monitors (AMS-4), interlocks, and alarming functions. The equipment covered is limited to the following:
   - Sample monitor cabinet, which includes the exhaust Beta-Gamma continuous air monitor and electrical outputs.
   - Primary stack exhauster
   - Associated local and remote alarms.

1.2.2 A CAM detector failure will be simulated and alarms checked for proper response.

1.2.3 A CAM low-sample flow rate will be simulated and alarms checked for proper response.

1.2.4 With POR06 Exhaust Stack running, a radioactive source will be introduced to the CAM, verifying the POR06 Exhaust Stack fan shuts down, alarms activate, and fan cannot be restarted with continuous air monitor sensing radiation greater than set points.

1.2.5 A CAM power failure will be simulated and alarms checked for proper response.
2.0 INFORMATION

2.1 General Information

2.1.1 All component identification numbers referenced in this procedure are preceded with “POR06-.” This prefix will not be repeated throughout the remainder of this document.

2.1.2 All deviations or discrepancies shall be reported to the Shift Manager immediately upon completion of this procedure and noted on the Comment Sheet 1.

2.1.3 Alarms may be acknowledged as necessary, but will only clear when the alarm cause condition has changed.

2.1.4 Alarms displayed in the “ACTIVE ALARMS” area of the alarm panel view PV-101 are acknowledged by first selecting the “ACKNOWLEDGE GEMS ALARMS [F8]” button, identifying the blinking active alarm, and pressing the function key assigned to that particular alarm (each alarm condition has its own unique acknowledge function key assigned). “F1” is then pressed to return to “ACTIVE ALARMS” area of PV-101.

2.1.5 If functional check cannot be performed in accordance with this procedure, the work shall be stopped and the Shift Manager shall be contacted to direct either return of equipment to a safe configuration or to proceed with test and note discrepancies on the Comment Sheet 1.
3.0 PRECAUTIONS AND LIMITATIONS

3.1 Personnel Safety

**WARNING** - Direct contact with the gamma source MUST be avoided. Source extension handle/rod shall be used exclusively. Failure to comply may cause unnecessary exposure to personnel.

3.1.1 Respiratory protection is required in conjunction with IHT monitoring when replacing air sample filters at primary exhausters.

3.1.1.1 Minimum required respiratory protection and voluntary upgrade is identified using one of the following:

- Farm specific TVIS, Respiratory Protection Form
- Farm specific TVIS, SEG 3.

3.1.2 IHT monitoring is required when inspecting/exchanging primary stack samples.

3.1.3 Industrial Hygiene monitoring requirements will be specified in the Industrial Hygiene Sample Plan (IHSP).

3.1.4 Job specific protective equipment requirements should be addressed during the pre-job brief and be in accordance with TFC-ESHQ-S_IS-C-02.

3.1.5 Hazardous voltages exist within enclosure.

3.1.6 Compliance with DOE-0359, Hanford Site Electrical Safety Program is required when working with this procedure.
3.2 Radiation and Contamination Control

3.2.1 When disconnecting, breaching or opening systems or system components that are currently or previously connected to waste tanks or waste transfer systems;

- Continuous HPT coverage is required
- Prejob and postjob surveys are required
- A wet rag will be used to contain the breach until radiological verifications have been performed.

3.2.2 To avoid excessive radiation exposure, do not directly touch the gamma source. Use the extension handle/rod at ALL times.

3.2.3 Work in Radiological Areas will be performed using a Radiological Work Permit following review by Radiological Control per the ALARA Work Planning procedure TFC-ESHQ-RP_RWP-C-03.
3.3 Environmental Compliance

3.3.1 Tank farm ventilation systems and exhaust monitoring systems are regulated under Washington State Administrative Code (WAC) Chapters 173-303, 173-400, 173-401, 173-460, and 246-247 and applicable Notices of Construction issued to ensure compliance with these regulations. To ensure reporting requirements are met, all planned and unplanned outages of Tank Farm ventilation equipment and exhaust monitoring systems, including portable exhausters, (on actively ventilated tanks) must be immediately reported to Environmental Compliance per Environmental On-Call List. Environmental Compliance will determine and make the required notifications pertaining to ventilation system outages.

3.3.2 Exhauster and stack monitoring record sampler and cam equipment outage, both planned and unplanned, must be reported to Environmental Compliance per TO-REC-001.

3.3.3 Startup and Shutdown of POR06 Exhauster Ventilating Tank(s) must be reported to Environmental Compliance per TO-REC-001.

3.3.4 IF functional checking of the CAM fails, Environmental shall be notified per TO-REC-001.
4.0 PREREQUISITES

4.1 Special Tools, Equipment, and Supplies

The following supplies may be needed to perform this procedure:

- Beta-Gamma Radiation Source capable of generating ≥ 10,000 counts per minute in the CAM
  Source Number ______________
- Two-way radio or cellular phone required for personnel inside the tank farm
- Hearing protection for the noise from radiation cabinet alarms
- Password for CAM "Air Monitor System-4 (AMS-4) Beta/Gamma Particle Monitor" Obtain from instrument supervisor/lead
- Vacuum grease for "O" rings.
- Other tools, equipment and supplies as identified by Shift Manager/OE/FWS/User.

4.2 Performance Documents

The following documents may be needed to perform this procedure:

- TF-OPS-018, “Inspections and Source Checks of POR06 AMS-4 CAMs and Effluent Record Samplers”
- TO-060-045, “Operate POR06 Exhauster”
- H-14-100867, “Sh. 6, 500 CFM Portable Exhausters B, C & D Assembly.”
4.3 Field Preparation

NOTE  Steps 4.3.1 through 4.3.3 may be performed in any order or concurrently.

_____ 4.3.1 A pre-job safety meeting shall be conducted by the FWS prior to starting the test. All personnel participating in the test shall read and understand the test.

_____ 4.3.2 Exhauster Primary Exhaust Stack Radiation Monitor System is in service with the primary exhaust fan operational.

_____ 4.3.3 The OE has notified Environmental Compliance per Section 3.3 that exhaust stack continuous air monitor functional checking will be conducted.

_________________________  /  ___________________________  /  ___________________________
Signature                  Print (First and Last)                    Date
Shift Manager

4.3.4 The Shift Manager shall be notified that all prerequisites in Section 4.3 of this procedure have been met:

_________________________  /  ___________________________  /  ___________________________
Signature  Print (First and Last)  Date
FWS
5.0 PROCEDURE

NOTE - Failed functional checks require documenting results on work record and data sheet and following the requirements in the Tank Farm Contractor Work Control procedure (reference TFC-OPS-MAINT-C-01).

5.1 Initial Conditions

NOTE - It is not unusual for the "LOW BETA COUNT" alarm to be activated upon initially energizing the CAM which is done by the Programmable Logic Controller after the exhauster motor is started. This may be due to software and clearing status registers anomalies.

- The "LOW BETA COUNT" alarm will shut the exhauster back down. If this should occur it is permissible to reset the alarm and continue with exhauster startup NO MORE THAN twice after which it should be treated as an actual CAM failure alarm and action taken as required by alarm response procedures.

5.1.1 CHECK CAM calibration AND RECORD:

<table>
<thead>
<tr>
<th>Calibration Due</th>
<th>Serial #</th>
</tr>
</thead>
</table>

5.1.2 IF CAM calibration is not valid, NOTIFY Shift Manager AND REPLACE CAM per appropriate work package.

NOTE - A clean filter installed prior to testing the CAM will aid in obtaining the proper response. This newly installed filter paper should remain in place at the conclusion of testing.

5.1.3 REQUEST sampler filter exchange be performed per TF-OPS-018, “Inspections and Source Checks of POR06 AMS-4 CAMs and Effluent Record Samplers.”
5.2 CAM Slow Alarm Setpoint

5.2.1 PRESS key [5] on CAM keypad.

5.2.2 RECORD As-found “SLOW ALARM SETPOINT” shown on the top line of the CAM display:

As-Found _______________ dpm/ft³.

5.2.3 IF As-Found “slow alarm setpoint” is 300 dpm/ft³, GO TO Step 5.2.5.

5.2.4 IF As-Found “slow alarm setpoint” is not 300 dpm/ft³, RESET the slow alarm setpoint to 300 dpm/ft³ through the following menus:

- PASSWORD
- ALARM PARAMETERS
- SLOW ALARM INTERVAL
- SLOW ALARM SETPOINT.

5.2.4.1 PRESS “EDIT” AND

TYPE “300” to change slow alarm setpoint to 300 dpm/ft³.

5.2.4.2 PRESS “ENTER” on keypad to accept changed setpoint.

5.2.4.3 PRESS “MENU” twice to return CAM to operation.

5.2.5 RECORD “SLOW ALARM SETPOINT” shown on the top line of the CAM display:

As-left _______________ dpm/ft³.
5.3 CAM Fast Alarm Setpoint

5.3.1 **PRESS** key [6] on CAM keypad.

5.3.2 **RECORD** As-found “FAST ALARM SETPOINT” shown on the top line of the CAM display:

\[
\text{As-Found} \quad \underline{\text{_______________}} \quad \text{dpm/ft}^3.
\]

5.3.3 **IF** As-Found “FAST ALARM SETPOINT” is 7,000 dpm/ft\(^3\), **GO TO** Step 5.3.5.

5.3.4 **IF** As-Found “FAST ALARM SETPOINT” is not 7,000 dpm/ft\(^3\), **RESET** the FAST ALARM SETPOINT to 7,000 dpm/ft\(^3\) through the following menus:

- PASSWORD
- ALARM PARAMETERS
- FAST ALARM INTERVAL
- FAST ALARM SETPOINT.

5.3.4.1 **PRESS** “EDIT” AND

**TYPE** “7000” to change fast alarm setpoint to 7000 dpm/ft\(^3\).

5.3.4.2 **PRESS** “ENTER” on keypad to accept changed setpoint.

5.3.4.3 **PRESS** “MENU” twice to return CAM to operation.

5.3.5 **RECORD** “FAST ALARM SETPOINT” shown on the top line of the CAM display:

\[
\text{As-left} \quad \underline{\text{_______________}} \quad \text{dpm/ft}^3.
\]
5.4 CAM Beta Net Alarm Setpoint

NOTE - For the purposes of this test the more conservative environmental limit from HNF-EP-0479, Tank Farm Facility Effluent Monitoring Plan of 3,000 counts per minute shall be used.

5.4.1 PRESS key [7] on CAM keypad.

5.4.2 RECORD As-found “(BETA) NET ALARM SETPOINT” shown on the top line of the CAM display:

As-Found ______________ CPM

5.4.3 IF As-Found “(BETA) NET ALARM SETPOINT” is 3,000 CPM, GO TO Step 5.4.6.

5.4.4 IF As-found “(BETA) NET ALARM SETPOINT” value (as found) is greater than 10,000 counts per minute, NOTIFY Shift Manager.

5.4.4.1 IF directed by Shift Manager to RESET “(BETA) NET ALARM SETPOINT”, GO TO Step 5.4.5.

5.4.4.2 IF directed by Shift Manager to not RESET “(BETA) NET ALARM SETPOINT”, GO TO Step 5.4.6 and note discrepancies on Comment Sheet 1

OR

RETURN equipment to a safe configuration in accordance with Restoration, Section 6.0.
5.4 CAM Beta Net Alarm Setpoint (Cont.)

5.4.5 **RESET** “(BETA) NET ALARM SETPOINT” to 3,000 CPM through the following menus:

- PASSWORD
- ALARM PARAMETERS
- (BETA) ALARM INTERVAL
- (BETA) ALARM SETPOINT.

5.4.5.1 **PRESS** “EDIT” AND

**TYPE** “3000” to change net alarm setpoint to 3000 cpm.

5.4.5.2 **PRESS** “ENTER” on keypad to accept changed setpoint.

5.4.5.3 **PRESS** “MENU” twice to return CAM to operation.

5.4.6 **RECORD** “(BETA) NET ALARM SETPOINT” shown on the top line of the CAM display:

As-left______________ CPM.
5.5 Simulate Stack CAM Detector Failure

NOTE - The CAM shuts down the fan on CAM Failures and High Rad conditions.

- Expect a delay of approximately 2 minutes for exhauster alarm interlock to activate.

5.5.1 CHECK stack CAM ALARM/INDICATOR status per Table:

<table>
<thead>
<tr>
<th>ALARM/INDICATOR</th>
<th>LOCATION</th>
<th>STATUS</th>
</tr>
</thead>
<tbody>
<tr>
<td>GREEN READY Lamp</td>
<td>VTP-CP-105 CAM Keypad Inside Panel</td>
<td>LIT</td>
</tr>
<tr>
<td>AMBER MALFUNCTION Lamp</td>
<td>VTP-CP-105 CAM Keypad Inside Panel</td>
<td>NOT LIT</td>
</tr>
<tr>
<td>CLEAR STROBE Lamp, VTP-XA-101</td>
<td>Above Sample Cabinet</td>
<td>NOT FLASHING</td>
</tr>
<tr>
<td>RED STROBE Lamp, VTP-XA-301</td>
<td>Above Sample Cabinet</td>
<td>NOT FLASHING</td>
</tr>
<tr>
<td>BELL</td>
<td>VTP-ENCL-107 Panel</td>
<td>SILENT</td>
</tr>
<tr>
<td>MONITOR SCREEN ALARM (AMS-4) NOTIFICATION CHIME &quot;VTP-RA-301&quot;</td>
<td>VTP-CP-105 Inside Panel</td>
<td>SILENT</td>
</tr>
<tr>
<td>NO VISIBLE GEMS ALARMS ON ALARM PANEL VIEW PV-101</td>
<td>Alarm Panel View PV-101 VTP-ENCL-107 Panel</td>
<td>ALARM PANEL VIEW PV-101 CLEAR</td>
</tr>
</tbody>
</table>

5.5.2 IF any acknowledgeable alarm/indicator status is not as listed, RESET the alarm/indicator.

5.5.2.1 IF not correctable, CONTACT Shift Manager for determination AND RECORD the Shift Manager’s determination on Comment Sheet 1.

5.5.3 PRESS MENU on the CAM keypad AND ENTER the password to access the Maintenance Menu.

5.5.4 PRESS DOWN [↓] arrow, UNTIL DETECTOR PARAMETERS is DISPLAYED.

5.5.5 PRESS ENTER.

5.5.6 PRESS DOWN [↓] arrow, UNTIL BETA HIGH VOLTAGE is DISPLAYED.
5.5 Simulate Stack CAM Detector Failure (Cont.)

NOTE - As-found high voltage value will be restored as recorded.

5.5.7 RECORD As-found high voltage: _________________

5.5.7.1 PRESS EDIT AND

TYPE "0" to change voltage to zero.

5.5.7.2 PRESS ENTER on keypad to accept changed voltage.

5.5.7.3 PRESS MENU twice to return CAM to operation.

NOTE - Expect 1-5 minutes for CAM MALFUNCTION indicator to display on AMS-4.

- Expect 2 minute delay for Strobe and Exhauster alarms.

5.5.8 VERIFY stack CAM ALARM/INDICATOR status per Table:

<table>
<thead>
<tr>
<th>ALARM/INDICATOR</th>
<th>LOCATION</th>
<th>STATUS</th>
</tr>
</thead>
<tbody>
<tr>
<td>GREEN READY Lamp</td>
<td>VTP-CP-105 CAM Keypad Inside Panel</td>
<td>NOT LIT</td>
</tr>
<tr>
<td>AMBER MALFUNCTION Lamp</td>
<td>VTP-CP-105 CAM Keypad Inside Panel</td>
<td>LIT</td>
</tr>
<tr>
<td>CLEAR STROBE Lamp, VTP-XA-101</td>
<td>Above Sample Cabinet</td>
<td>FLASHING</td>
</tr>
<tr>
<td>RED STROBE Lamp, VTP-XA-301</td>
<td>Above Sample Cabinet</td>
<td>NOT FLASHING</td>
</tr>
<tr>
<td>BELL</td>
<td>VTP-Encl-107 Panel</td>
<td>SILENT</td>
</tr>
<tr>
<td>MONITOR SCREEN ALARM (AMS-4) NOTIFICATION CHIME &quot;VTP-RA-301&quot;</td>
<td>VTP-CP-105 Inside Panel</td>
<td>CHIMING</td>
</tr>
<tr>
<td>CAM DETECTOR FAILURE VISIBLE ON ALARM PANEL VIEW PV-101</td>
<td>Alarm Panel View PV-101 VTP-ENCL-107 Panel</td>
<td>VISIBLE ON ALARM PANEL VIEW PV-101 &quot;POR06-VTP-RA301 BETA CAM FAIL&quot;</td>
</tr>
</tbody>
</table>

_________________________ / __________________________ / ___________
Signature                        Print (First and Last)            Date
Technician Signature
5.5 Simulate Stack CAM Detector Failure (Cont.)

5.5.9 IF any acknowledgeable alarm/indicator status is not as listed, **RESET** alarm/indicator.

5.5.9.1 **IF** not correctable, **CONTACT** Shift Manager for determination AND **RECORD** the Shift Manager’s determination on Comment Sheet 1.

5.5.10 **VERIFY** exhauster has SHUT DOWN.

____________________ / __________________ / 
Signature Print (First and Last) Date
Technician Signature

5.5.11 **CHECK** annunciator status at VTP-ENCL-107:

<table>
<thead>
<tr>
<th>DISPLAY</th>
<th>ANNUNCIATOR TITLE</th>
<th>STATUS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Alarm Panel View PV-101</td>
<td>POR06-VTP-RA301 BETA CAM FAIL</td>
<td>ALARMED</td>
</tr>
</tbody>
</table>

5.5.12 **PRESS** "Alarm Ack" BUTTON on CAM VTP-RA-301 to acknowledge alarm.

5.5.13 **CHECK** the following:
- INDICATOR "Malfunction" AMBER is ON
- Horn on Radiation Cabinet is silenced.
5.5 Simulate Stack CAM Detector Failure (Cont.)

5.5.14  **RESTORE** CAM BETA HIGH VOLTAGE to as-found value:

5.5.14.1 **PRESS** MENU on the CAM keypad **AND**

**ENTER** password to access the Maintenance Menu.

5.5.14.2 **PRESS** DOWN [↓] arrow, **UNTIL** DETECTOR PARAMETERS is DISPLAYED **AND**

**PRESS** ENTER.

5.5.14.3 **PRESS** DOWN [↓] arrow, **UNTIL** BETA HIGH VOLTAGE is DISPLAYED **AND**

**PRESS** EDIT.

5.5.14.4 **ENTER** as-found value from Step 5.5.7.

5.5.14.5 **RECORD** As-left high voltage: _

5.5.14.6 **PRESS** ENTER on keypad to accept voltage input.

5.5.14.7 **PRESS** MENU (twice) to return CAM to operation.

5.5.15 **START** fans per operating procedure TO-060-045, test procedure, work package or approved work plan.
5.6 **Low Sample Flow Rate Alarm Test**

**NOTE** - Expect 2-10 minutes for CAM READY indicator to respond.
- Alarm panel view PV-101 may display “POR06-VTP-FCV-302 CAM SAMPLE FLOW LO.”

5.6.1 **CHECK** stack CAM ALARM/INDICATOR status per Table:

<table>
<thead>
<tr>
<th>ALARM/INDICATOR</th>
<th>LOCATION</th>
<th>STATUS</th>
</tr>
</thead>
<tbody>
<tr>
<td>GREEN READY Lamp</td>
<td>VTP-CP-105 CAM Keypad Inside Panel</td>
<td>LIT</td>
</tr>
<tr>
<td>AMBER MALFUNCTION Lamp</td>
<td>VTP-CP-105 CAM Keypad Inside Panel</td>
<td>NOT LIT</td>
</tr>
<tr>
<td>CLEAR STROBE Lamp, VTP-XA-101</td>
<td>Above Sample Cabinet</td>
<td>NOT FLASHING</td>
</tr>
<tr>
<td>RED STROBE Lamp, VTP-XA-301</td>
<td>Above Sample Cabinet</td>
<td>NOT FLASHING</td>
</tr>
<tr>
<td>BELL</td>
<td>VTP-Encl-107 Panel</td>
<td>SILENT</td>
</tr>
<tr>
<td>MONITOR SCREEN ALARM (AMS-4)</td>
<td>VTP-CP-105 Inside Panel</td>
<td>SILENT</td>
</tr>
<tr>
<td>NOTIFICATION CHIME &quot;VTP-RA-301&quot;</td>
<td></td>
<td></td>
</tr>
<tr>
<td>NO VISIBLE GEMS ALARMS ON ALARM PANEL VIEW PV-101</td>
<td>Alarm Panel View PV-101 VTP-ENCL-107 Panel</td>
<td>ALARM PANEL VIEW PV-101 CLEAR</td>
</tr>
</tbody>
</table>

5.6.2 **IF** any acknowledgeable alarm/indicator status is not as listed, **RESET** alarm/indicator.

5.6.2.1 **IF** not correctable, **CONTACT** Shift Manager for determination **AND** **RECORD** the Shift Manager’s determination on Comment Sheet 1.

5.6.3 **CLOSE** hand valve VTP-V-302.
5.6 Low Sample Flow Rate Alarm Test (Cont.)

NOTE - Expect a delay of approximately 30-60 seconds for exhauster alarm interlock to activate.

5.6.4 **VERIFY** stack CAM ALARM/INDICATOR status per Table:

<table>
<thead>
<tr>
<th>ALARM/INDICATOR</th>
<th>LOCATION</th>
<th>STATUS</th>
</tr>
</thead>
<tbody>
<tr>
<td>GREEN READY Lamp</td>
<td>VTP-CP-105 CAM Keypad Inside Panel</td>
<td>NOT LIT</td>
</tr>
<tr>
<td>AMBER MALFUNCTION Lamp</td>
<td>VTP-CP-105 CAM Keypad Inside Panel</td>
<td>LIT</td>
</tr>
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</tr>
<tr>
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<tr>
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<td>SILENT</td>
</tr>
<tr>
<td>MONITOR SCREEN ALARM (AMS-4)</td>
<td>VTP-CP-105 Inside Panel</td>
<td>CHIMING</td>
</tr>
<tr>
<td>NOTIFICATION CHIME &quot;VTP-RA-301&quot;</td>
<td></td>
<td></td>
</tr>
<tr>
<td>NO VISIBLE GEMS ALARMS ON ALARM</td>
<td>Alarm Panel View PV-101 VTP-ENCL-107 Panel</td>
<td>&quot;Visible on alarm panel view PV-101 POR06-VTP-FCV-302 CAM SAMP FLOW LO&quot;</td>
</tr>
</tbody>
</table>

5.6.5 **IF** any acknowledgeable alarm/indicator status is not as listed, **RESET** alarm/indicator.

5.6.5.1 **IF** not correctable, **CONTACT** Shift Manager for determination AND **RECORD** the Shift Manager’s determination on Comment Sheet 1.

5.6.6 **VERIFY** exhauster has SHUT DOWN.

5.6.7 **CHECK** status:
- CAM DISPLAY indicates "LOW FLOW FAIL BELOW MIN FLOW"
- INDICATOR "Malfunction" AMBER light is ON.
5.6 Low Sample Flow Rate Alarm Test (Cont.)

5.6.8 **OPEN** hand valve VTP-V-302.

5.6.9 **ACKNOWLEDGE** “POR06-VTP-FCV-302 CAM SAMPLE FLOW LO” alarm.

5.6.10 **ACKNOWLEDGE** all secondary alarms displayed in Alarm Panel View PV-101.

5.6.11 **PRESS** "Alarm Ack" button on CAM (AMS-4).

5.6.12 **START** fan per TO-060-045, test procedure, work package or approved work plan.

**NOTE** - Expect 2-10 minutes for CAM READY indicator to respond.

5.6.13 **CHECK** stack CAM ALARM/INDICATOR status per Table:

<table>
<thead>
<tr>
<th>ALARM/INDICATOR</th>
<th>LOCATION</th>
<th>STATUS</th>
</tr>
</thead>
<tbody>
<tr>
<td>GREEN READY Lamp</td>
<td>VTP-CP-105 CAM Keypad Inside Panel</td>
<td>LIT</td>
</tr>
<tr>
<td>AMBER MALFUNCTION Lamp</td>
<td>VTP-CP-105 CAM Keypad Inside Panel</td>
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<tr>
<td>CLEAR STROBE Lamp, VTP-XA-101</td>
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<td>VTP-Encl-107 Panel</td>
<td>SILENT</td>
</tr>
<tr>
<td>MONITOR SCREEN ALARM (AMS-4)</td>
<td>VTP-CP-105 Inside Panel</td>
<td>SILENT</td>
</tr>
<tr>
<td>NOTIFICATION CHIME &quot;VTP-RA-301&quot;</td>
<td></td>
<td></td>
</tr>
<tr>
<td>NO VISIBLE GEMS ALARMS ON ALARM PANEL VIEW PV-101</td>
<td>Alarm Panel View PV-101 VTP-ENCL-107 Panel</td>
<td>ALARM PANEL VIEW PV-101 CLEAR</td>
</tr>
</tbody>
</table>

5.6.14 **IF** any acknowledgeable alarm/indicator status is not as listed, **RESET** alarm/indicator.

5.6.14.1 **IF** not correctable, **CONTACT** Shift Manager for determination **AND**

**RECORD** the Shift Manager’s determination on Comment Sheet 1.
5.7 High Radiation Alarm and Fan Interlock

5.7.1 ENSURE exhaust fan is on.

5.7.2 SIMULATE HIGH alarm condition:

5.7.2.1 PRESS MENU on CAM AND ENTER password to access the Maintenance Menu.

5.7.2.2 PRESS DOWN [↓] arrow key, UNTIL INSTRUMENT PARAMETERS is DISPLAYED AND PRESS ENTER.

5.7.2.3 PRESS DOWN [↓] arrow, UNTIL GAMMA SUBTRACT FACTOR is DISPLAYED.

NOTE - As-found GAMMA SUBTRACT FACTOR will be restored as the value recorded.

5.7.2.4 RECORD as-found GAMMA SUBTRACT FACTOR:

5.7.2.5 PRESS EDIT AND ENTER zero to change value to zero.

5.7.2.6 PRESS ENTER to accept input value.

5.7.2.7 PRESS MENU (twice) to return CAM to operation.

WARNING

Direct contact with the gamma source MUST be avoided. Source extension handle/rod shall be used exclusively. Failure to comply may cause unnecessary exposure to personnel.

5.7.3 PLACE AND HOLD gamma source (V-block) at detector head, pointing towards the beta detector located at the stack in the "Beta/Gamma Enclosure".
5.7 High Radiation Alarm and Fan Interlock (Cont.)

NOTE - CAM Ready light and malfunction light may change status with loss of flow and fast alarm monitoring conditions, but have no bearing on outcome of functional check.

5.7.4 VERIFY stack CAM ALARM/INDICATOR status per Table:

<table>
<thead>
<tr>
<th>ALARM/INDICATOR</th>
<th>LOCATION</th>
<th>STATUS</th>
</tr>
</thead>
<tbody>
<tr>
<td>GREEN READY Lamp</td>
<td>VTP-CP-105 CAM Keypad</td>
<td>LIT</td>
</tr>
<tr>
<td></td>
<td>Inside Panel</td>
<td></td>
</tr>
<tr>
<td>AMBER MALFUNCTION Lamp</td>
<td>VTP-CP-105 CAM Keypad</td>
<td>NOT LIT</td>
</tr>
<tr>
<td></td>
<td>Inside Panel</td>
<td></td>
</tr>
<tr>
<td>CLEAR STROBE Lamp, VTP-XA-101</td>
<td>Above Sample Cabinet</td>
<td>FLASHING</td>
</tr>
<tr>
<td>RED STROBE Lamp, VTP-XA-301</td>
<td>Above Sample Cabinet</td>
<td>FLASHING</td>
</tr>
<tr>
<td>BELL</td>
<td>VTP-Encl-107 Panel</td>
<td>RINGING</td>
</tr>
<tr>
<td>MONITOR SCREEN ALARM (AMS-4)</td>
<td>VTP-CP-105 Inside Panel</td>
<td>CHIMING</td>
</tr>
<tr>
<td>NOTIFICATION CHIME &quot;VTP-RA-301&quot;</td>
<td></td>
<td></td>
</tr>
<tr>
<td>CAM BETA HI VISIBLE ON ALARM</td>
<td>Alarm Panel View PV-101</td>
<td>VISIBLE ON</td>
</tr>
<tr>
<td>PANEL VIEW PV-101</td>
<td></td>
<td>ALARM PANEL</td>
</tr>
<tr>
<td></td>
<td></td>
<td>VIEW PV-101</td>
</tr>
<tr>
<td></td>
<td></td>
<td>VTP-ENCL-107 Panel</td>
</tr>
<tr>
<td></td>
<td></td>
<td>&quot;POR06-VTP-RA301 BETA HI RAD&quot;</td>
</tr>
</tbody>
</table>

_________________________/_____________________/_________________________
Signature                  Print (First and Last) Date
Technician Signature

5.7.5 IF any acknowledgeable alarm/indicator status is not as listed, RESET alarm/indicator.

5.7.5.1 IF not correctable, CONTACT Shift Manager for determination AND

RECORD the Shift Manager’s determination on Comment Sheet 1.

5.7.6 VERIFY exhaust fan is SHUT DOWN.

_________________________/_____________________/_________________________
Signature                  Print (First and Last) Date
Technician Signature

5.7.7 ATTEMPT to RESTART exhaust fan per operating procedure TO-060-045, test procedure, work package or approved work plan.
Perform Portable Exhauster POR06 (Skid D) CAM Alarm/Interlock Functional Check

5.7 High Radiation Alarm and Fan Interlock (Cont.)

5.7.8 VERIFY exhaust fan does not start.

_________________________/_________________________/___________
Signature Print (First and Last) Date
Technician Signature

5.7.9 REMOVE the gamma source from the CAM area.

5.7.10 PRESS "ALARM ACK" button twice on CAM (AMS-4).

5.7.11 WAIT until CAM (AMS-4) indication is at or near zero AND

ACKNOWLEDGE “POR06-VTP-RA-301 BETA HI RAD” alarm.

5.7.12 ACKNOWLEDGE all secondary alarms displayed in Alarm Panel View PV-101.

5.7.13 RESTORE GAMMA SUBTRACT FACTOR to as-found value:

5.7.13.1 PRESS MENU key on CAM AND

ENTER password to access the Maintenance Menu.

5.7.13.2 PRESS DOWN [↓] arrow, UNTIL INSTRUMENT PARAMETERS is DISPLAYED AND

PRESS ENTER.

5.7.13.3 PRESS DOWN [↓] arrow, UNTIL GAMMA SUBTRACT FACTOR is DISPLAYED AND

PRESS EDIT.

5.7.13.4 ENTER as-found value from Step 5.7.2.4.

As-Left value________________

5.7.13.5 PRESS ENTER to accept input value.

5.7.13.6 PRESS MENU twice to return CAM to OPERATION.
5.7 High Radiation Alarm and Fan Interlock (Cont.)

NOTE - CAM malfunction light may be on and should clear within 2-10 minutes of fan startup.

5.7.14 **START** fan per TO-060-045, test procedure, work package or approved work plan.

5.7.15 **CHECK** stack CAM ALARM/INDICATOR status per Table:

<table>
<thead>
<tr>
<th>ALARM/INDICATOR</th>
<th>LOCATION</th>
<th>STATUS</th>
</tr>
</thead>
<tbody>
<tr>
<td>GREEN READY Lamp</td>
<td>VTP-CP-105 CAM Keypad Inside Panel</td>
<td>LIT</td>
</tr>
<tr>
<td>AMBER MALFUNCTION Lamp</td>
<td>VTP-CP-105 CAM Keypad Inside Panel</td>
<td>NOT LIT</td>
</tr>
<tr>
<td>CLEAR STROBE Lamp, VTP-XA-101</td>
<td>Above Sample Cabinet</td>
<td>NOT FLASHING</td>
</tr>
<tr>
<td>RED STROBE Lamp, VTP-XA-301</td>
<td>Above Sample Cabinet</td>
<td>NOT FLASHING</td>
</tr>
<tr>
<td>BELL</td>
<td>VTP-Encl-107 Panel</td>
<td>SILENT</td>
</tr>
<tr>
<td>MONITOR SCREEN ALARM (AMS-4) NOTIFICATION CHIME &quot;VTP-RA-301&quot;</td>
<td>VTP-CP-105 Inside Panel</td>
<td>SILENT</td>
</tr>
<tr>
<td>NO VISIBLE GEMS ALARMS ON ALARM PANEL VIEW PV-101</td>
<td>Alarm Panel View PV-101 VTP-ENCL-107 Panel</td>
<td>ALARM PANEL VIEW PV-101 CLEAR</td>
</tr>
</tbody>
</table>

5.7.16 **IF** any acknowledgeable alarm/indicator status is not as listed, **RESET** alarm/indicator.

5.7.16.1 **IF** not correctable, **CONTACT** Shift Manager for determination **AND**

**RECORD** the Shift Manager’s determination on Comment Sheet 1.
5.8 Exhaust Stack CAM Power Failure

5.8.1 POSITION CAM power switch (located on back of CAM) to OFF.

5.8.2 VERIFY stack CAM ALARM/INDICATOR status per Table:

<table>
<thead>
<tr>
<th>ALARM/INDICATOR</th>
<th>LOCATION</th>
<th>STATUS</th>
</tr>
</thead>
<tbody>
<tr>
<td>GREEN READY Lamp</td>
<td>VTP-CP-105 CAM Keypad Inside Panel</td>
<td>NOT LIT</td>
</tr>
<tr>
<td>AMBER MALFUNCTION Lamp</td>
<td>VTP-CP-105 CAM Keypad Inside Panel</td>
<td>NOT LIT</td>
</tr>
<tr>
<td>CLEAR STROBE Lamp, VTP-XA-101</td>
<td>Above Sample Cabinet</td>
<td>FLASHING</td>
</tr>
<tr>
<td>RED STROBE Lamp, VTP-XA-301</td>
<td>Above Sample Cabinet</td>
<td>NOT FLASHING</td>
</tr>
<tr>
<td>BELL</td>
<td>VTP-Encl-107 Panel</td>
<td>SILENT</td>
</tr>
</tbody>
</table>

CAM DETECTOR FAILURE VISIBLE ON ALARM PANEL VIEW PV-101
VTP-ENCL-107 Panel
VISIBLE ON ALARM PANEL VIEW PV-101 "POR06-VTP-RA301 BETA CAM FAIL"

5.8.3 IF any acknowledgeable alarm/indicator status is not as listed, RESET alarm/indicator.

5.8.3.1 IF not correctable, CONTACT Shift Manager for determination AND RECORD the Shift Manager’s determination on Comment Sheet 1.

5.8.4 VERIFY exhauster has SHUT DOWN.

5.8.5 ACKNOWLEDGE “POR06-VTP-RA-301 BETA CAM FAIL” alarm.

5.8.6 POSITION CAM power switch (located in back of CAM) to ON.

5.8.7 POSITION CAM switch to ON.

5.8.8 START fan per TO-060-045, test procedure, work package or approved work plan.
Perform Portable Exhauster POR06 (Skid D) CAM Alarm/Interlock Functional Check

6.0 RESTORATION

NOTE - Expect 2-10 minutes for CAM READY indicator to respond.

6.1.1 CHECK stack CAM ALARM/INDICATOR status per Table:

<table>
<thead>
<tr>
<th>ALARM/INDICATOR</th>
<th>LOCATION</th>
<th>STATUS</th>
</tr>
</thead>
<tbody>
<tr>
<td>GREEN READY Lamp</td>
<td>VTP-CP-105 CAM Keypad Inside Panel</td>
<td>LIT</td>
</tr>
<tr>
<td>AMBER MALFUNCTION Lamp</td>
<td>VTP-CP-105 CAM Keypad Inside Panel</td>
<td>NOT LIT</td>
</tr>
<tr>
<td>CLEAR STROBE Lamp, VTP-XA-101</td>
<td>Above Sample Cabinet</td>
<td>NOT FLASHING</td>
</tr>
<tr>
<td>RED STROBE Lamp, VTP-XA-301</td>
<td>Above Sample Cabinet</td>
<td>NOT FLASHING</td>
</tr>
<tr>
<td>BELL</td>
<td>VTP-Encl-107 Panel</td>
<td>SILENT</td>
</tr>
<tr>
<td>MONITOR SCREEN ALARM (AMS-4)</td>
<td>VTP-CP-105 Inside Panel</td>
<td>SILENT</td>
</tr>
<tr>
<td>NOTIFICATION CHIME &quot;VTP-RA-301&quot;</td>
<td></td>
<td></td>
</tr>
<tr>
<td>NO VISIBLE GEMS ALARMS ON ALARM PANEL VIEW PV-101</td>
<td>Alarm Panel View PV-101 VTP-ENCL-107 Panel</td>
<td>ALARM PANEL VIEW PV-101 CLEAR</td>
</tr>
</tbody>
</table>

6.1.2 IF any acknowledgeable alarm/indicator status is not as listed, RESET alarm/indicator.

6.1.2.1 IF not correctable, CONTACT Shift Manager for determination AND RECORD on Comment Sheet 1.

6.1.3 RESTORE Exhaust Stack Radiation Monitor components to the pre-test configuration

OR

AS DIRECTED by Shift Manager with those Directions recorded on Comment Sheet 1.

6.1.4 NOTIFY Shift Manager that testing is COMPLETED.

Signature / Date/Time
Print (First and Last)

Signature / Date/Time
Print (First and Last)

FWS

Shift Manager
### 6.0 Restoration (Cont.)

6.1.5 **REPORT** discrepancies to the Shift Manager.

6.1.6 **RETURN** radiation source to the Health Physics Technician's office.

### 6.2 Acceptance Criteria

6.2.1 **VERIFY** Sections 5.1 through 6.0 of this procedure have been completed and systems/components performed as specified or all exceptions noted in Comment Sheet 1 have been resolved.

<table>
<thead>
<tr>
<th>Signature</th>
<th>Print (First and Last)</th>
<th>Date</th>
</tr>
</thead>
<tbody>
<tr>
<td>FWS</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

6.2.2 **ROUTE** this procedure to Shift Manager for completion of Section 6.3.

### 6.3 Review

6.3.1 Shift Manager shall **REVIEW AND EVALUATE** test data for acceptability. Any deficiencies identified and actions taken shall be noted on Comment Sheet 1.

<table>
<thead>
<tr>
<th>Signature</th>
<th>Print (First and Last)</th>
<th>Date</th>
</tr>
</thead>
<tbody>
<tr>
<td>Shift Manager</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

6.3.2 System Engineer shall **REVIEW AND EVALUATE** test data for acceptability. Any deficiencies identified and actions taken shall be noted on Comment Sheet 1.

<table>
<thead>
<tr>
<th>Signature</th>
<th>Print (First and Last)</th>
<th>Date</th>
</tr>
</thead>
<tbody>
<tr>
<td>System Engineer</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
6.4 Records

This procedure is performed within a work package, as such, the procedure in its entirety will be maintained as a record per the Work Control process.

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.
# Perform Portable Exhauster POR06 (Skid D) CAM Alarm/Interlock Functional Check

Data Table 1 – POR06

<table>
<thead>
<tr>
<th>Serial Number:</th>
<th>Calibration Due Date:</th>
<th>(AC) Acceptance Criteria</th>
</tr>
</thead>
<tbody>
<tr>
<td>As-Found</td>
<td>Desired Value</td>
<td>As-Left</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Initial Setpoints:</th>
<th>Slow alarm setpoint (DPM/ft³)</th>
<th>300 (299-301) DPM/ft³</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Fast alarm setpoint (DPM/ft³)</td>
<td>7000 (6999-7001) DPM/ft³</td>
</tr>
<tr>
<td></td>
<td>Beta alarm setpoint (DPM/ft³)</td>
<td>3000 (2999-3001) DPM/ft³</td>
</tr>
</tbody>
</table>

**Test Steps**

<table>
<thead>
<tr>
<th>Stack CAM Detector Failure Test (Section 5.5)</th>
<th>Tech: / Signature</th>
<th>Print (First and Last) / Date</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>Low Sample Flow Rate Alarm Test (Section 5.6)</th>
<th>Tech: / Signature</th>
<th>Print (First and Last) / Date</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>High Radiation Alarm and Fan Interlock Test (Section 5.7)</th>
<th>Tech: / Signature</th>
<th>Print (First and Last) / Date</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>Exhaust Stack CAM Power Failure Test (Section 5.8)</th>
<th>Tech: / Signature</th>
<th>Print (First and Last) / Date</th>
</tr>
</thead>
</table>

**Review Complete**

<table>
<thead>
<tr>
<th>Restoration (Section 6.0)</th>
<th>FWS: / Signature</th>
<th>Print (First and Last) / Date</th>
</tr>
</thead>
<tbody>
<tr>
<td>Shift Manager:</td>
<td>/ Signature</td>
<td>/ Date</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>CAM Detector Failure:</th>
<th>As-Found</th>
<th>As-Left</th>
</tr>
</thead>
<tbody>
<tr>
<td>Beta High Voltage</td>
<td></td>
<td></td>
</tr>
<tr>
<td>High Radiation</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Gamma Subtract Factor</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

- Any discrepancies are to be noted on Comment Sheet 1

* - Any discrepancies are to be noted on Comment Sheet 1
Comment Sheet 1

Record any comments encountered during performance of test below. *

WORK PACKAGE NO.: DATE:

* If no comments are made, a signature is not required.

Signature / Print (First and Last) / Date

Commenter

ENVIRONMENTAL RECORD
Functional Check Signature Sheet 1

All persons participating in performance of this Test shall enter their printed name, signature and initials below.

<table>
<thead>
<tr>
<th>NAME (PRINT)</th>
<th>SIGNATURE</th>
<th>INITIALS</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
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<tr>
<td></td>
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</tr>
</tbody>
</table>