Perform Portable Exhauster POR-008 Alarm/Interlock Functional Check

Tank Farm Maintenance Procedure

VENTILATION

USQ # N/A-4

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1.0 PURPOSE AND SCOPE

1.1 Purpose

This procedure provides instructions to perform a functional check of portable exhauster POR-008 CAM alarm/interlock system and associated alarms.

1.2 Scope

1.2.1 This procedure covers functionally checking the POR-008 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 POR-008 Exhaust Stack running, a radioactive source will be introduced to the CAM, verifying the POR-008 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 “POR-008-VTP-.” 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 Page.

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 return equipment to a safe configuration or to proceed with test and note discrepancies on the Comment Page.
3.0 PRECAUTIONS AND LIMITATIONS

3.1 Personnel Safety

**WARNING** - To avoid radiation exposure direct contact with gamma source must be avoided.

3.1.1 Hazardous voltages exist within enclosure and extreme caution should be used. Failure to follow electrical safety practices as outlined in DOE–0359, Hanford Site Electrical Safety Program.

3.1.2 If during the performance of this procedure any of the following conditions are found immediately stop work, place equipment in a safe condition, notify FWS and proceed as directed:

- Any equipment malfunction which could prevent fulfillment of its functional requirements
- Procedural inadequacy which could prevent fulfillment of procedural requirements.

3.1.3 Comply with plant/facility specific lock and tag and over-tagging requirements, as applicable.
3.2 Radiation and Contamination Control

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

3.2.2 When work is performed in or when work will result in a high contamination, high radiation, or an airborne radioactive area, an approved work package must be developed, which is reviewed by Radiological Control per the ALARA Work Planning procedure TFC-ESHQ-RWP-C-03.

3.2.3 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
   - Pre-job and post-job surveys are required
   - A wet rag will be used to contain the breach until radiological verifications have been performed.

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 per Environmental On-Call List. Environmental will determine and make the required notifications pertaining to ventilation system outages.

3.3.2 Exhauster and stack monitoring record sampler equipment outage, both planned and unplanned, must be reported to Environmental per the Environmental On-Call List.
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 $\geq 10,000$ cpm
  Source Number  
- Two-way radio or cellular phone required for personnel inside tank farm
- Hearing protection
- Password for CAM “Air Monitor System-4 (AMS-4) Beta/Gamma Particle Monitor”; obtain from instrument FWS
- Vacuum grease for “O” rings
- Handheld calculator
- Other tools, equipment and supplies as identified by Shift Manager/OE/FWS/User.

4.2 Performance Documents

The following procedures may be needed to perform this procedure:
- TF-OPS-018, “Inspections and Source Checks of POR06, and POR-008 AMS-4 CAMs and Effluent Record Samplers”
- TO-060-006, “Operate POR-008 Exhauster”
- 6-RM-168, “Eberline AMS-4 Continuous Air Monitor Calibration and Field Installation”
- H-14-105672, Sheets 1-4 Ventilation Tank Primary System (VTP) POR-008 P&ID.
4.3 Field Preparations

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 Supervisor/Lead prior to starting test. All personnel participating in test shall read and understand test procedure and complete Functional Check Signature Sheet.

4.3.2 Exhauster stack radiation monitor system is in service with exhaust fan operational.

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

Signature / Print / Date
Shift Manager

4.3.4 Shift Manager has been notified all prerequisites in Section 4.3 have been met:

Signature / Print / Date
FWS
5.0 PROCEDURE

NOTE - Failed functional checks require documenting results on work record and data sheet and following the requirements in the TFC-OPS-MAINT-C-01 “Tank Operations Contractor Work Control.”

5.1 Initial Conditions

Special Instructions

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 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, PERFORM the following:

5.1.2.1 NOTIFY Shift Manager

5.1.2.2 REPLACE CAM per appropriate work package.

NOTE - A clean filter installed prior to testing the CAM will aide 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, and POR-008 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 top line of CAM display:

As-Found _________ dpm/ft³.

5.2.3 IF As-Found slow alarm setpoint is 300 dpm/ft³, GO TO Step 5.3.1.

5.2.4 IF As-Found slow alarm setpoint is not 300 dpm/ft³, RESET 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 top line of 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 top line of CAM display:
As-Found _______ dpm/ft³.

5.3.3 **IF** As-Found “FAST ALARM SETPOINT” is 7,000 dpm/ft³, **GO TO** Step 5.3.5.

5.3.4 **IF** As-Found “FAST ALARM SETPOINT” is not 7,000 dpm/ft³, **RESET** “FAST ALARM SETPOINT” to 7,000 dpm/ft³ 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/ft³.

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 top line of CAM display:
As-Left _______ dpm/ft³.
5.4 CAM Beta Net Alarm Setpoint

NOTE - For the purposes of this test, the more conservative environmental limit from HNF-EP-0479, “Facility Effluent Monitoring Plan for the Tank Farms” of 3,000 cpm shall be used.

5.4.1 PRESS key [7] on CAM keypad.

5.4.2 RECORD As-Found “(BETA) NET ALARM SETPOINT” shown on top line of 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 is greater than 10,000 cpm, 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”, PERFORM one of the following:

a. GO TO Step 5.4.6 and note discrepancies on Comment Page.

OR

b. RETURN equipment to a safe configuration in accordance with Section 5.9.
Perform Portable Exhauster POR-008 Alarm/Interlock Functional Check

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 top line of CAM display:

As-Left _____________ cpm.
Perform Portable Exhauster POR-008 Alarm/Interlock Functional Check

5.5 Simulate Stack CAM Detector Failure

NOTE - The CAM shuts down the fan on CAM failures and high radiation conditions.

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

5.5.1 CHECK stack CAM alarm/indicator status and exhauster message view status:

<table>
<thead>
<tr>
<th>ALARM/INDICATOR</th>
<th>LOCATION</th>
<th>STATUS</th>
</tr>
</thead>
<tbody>
<tr>
<td>GREEN READY Lamp</td>
<td>CP-105 CAM Keypad Inside Panel</td>
<td>LIT</td>
</tr>
<tr>
<td>AMBER MALFUNCTION Lamp</td>
<td>CP-105 CAM Keypad Inside Panel</td>
<td>NOT LIT</td>
</tr>
<tr>
<td>CLEAR STROBE Lamp, XA-101</td>
<td>Above Sample Cabinet</td>
<td>NOT FLASHING</td>
</tr>
<tr>
<td>RED STROBE Lamp, XA-301</td>
<td>Above Sample Cabinet</td>
<td>NOT FLASHING</td>
</tr>
<tr>
<td>BELL</td>
<td>ENCL-107 Panel</td>
<td>SILENT</td>
</tr>
<tr>
<td>MONITOR SCREEN ALARM (AMS-4) NOTIFICATION CHIME &quot;VTP-RA-301&quot;</td>
<td>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 alarm/indicator.

5.5.2.1 IF not correctable, CONTACT Shift Manager for determination AND

RECORD the Shift Manager’s determination on comment page.
Perform Portable Exhauster POR-008 Alarm/Interlock Functional Check

5.5 Simulate Stack CAM Detector Failure (Cont.)

5.5.3 PRESS “MENU” on CAM keypad AND

ENTER password to access 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.

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.
Perform Portable Exhauster POR-008 Alarm/Interlock Functional Check

5.5 Simulate Stack CAM Detector Failure (Cont.)

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 CHECK stack CAM alarm/indicator status:

<table>
<thead>
<tr>
<th>ALARM/INDICATOR</th>
<th>LOCATION</th>
<th>STATUS</th>
</tr>
</thead>
<tbody>
<tr>
<td>GREEN READY Lamp</td>
<td>CP-105 CAM Keypad Inside Panel</td>
<td>NOT LIT</td>
</tr>
<tr>
<td>AMBER MALFUNCTION Lamp</td>
<td>CP-105 CAM Keypad Inside Panel</td>
<td>LIT</td>
</tr>
<tr>
<td>CLEAR STROBE Lamp, XA-101</td>
<td>Above Sample Cabinet</td>
<td>FLASHING</td>
</tr>
<tr>
<td>RED STROBE Lamp, XA-301</td>
<td>Above Sample Cabinet</td>
<td>NOT FLASHING</td>
</tr>
<tr>
<td>BELL</td>
<td>ENCL-107 Panel</td>
<td>SILENT</td>
</tr>
<tr>
<td>MONITOR SCREEN ALARM (AMS-4) NOTIFICATION CHIME &quot;VTP-RA-301&quot;</td>
<td>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;POR-008-VTP-RA301 BETA CAM FAIL&quot;</td>
</tr>
</tbody>
</table>
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 page.

5.5.10 **CHECK** exhauster has SHUT DOWN.

5.5.11 **CHECK** annunciator status at 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>POR-008-VTP-RA301</td>
<td>ALARMED</td>
</tr>
<tr>
<td></td>
<td>BETA CAM FAIL</td>
<td></td>
</tr>
</tbody>
</table>

5.5.12 **ACKNOWLEDGE** alarm on Alarm Panel View PV-101 VTP-ENCL-107 Panel.

5.5.13 **PRESS** “ALARM ACK” button on CAM RA-301 to acknowledge alarm.

5.5.14 **CHECK** the following:

- INDICATOR “Malfunction” AMBER is ON
- Horn on AMS-4 electronic unit is silenced.
5.5 Simulate Stack CAM Detector Failure (Cont.)

5.5.15 RESTORE “CAM BETA HIGH VOLTAGE” to As-Found value:

5.5.15.1 PRESS “MENU” on CAM keypad AND
ENTER password to access Maintenance Menu.

5.5.15.2 PRESS DOWN [↓] arrow until “DETECTOR PARAMETERS” is DISPLAYED AND
PRESS “ENTER.”

5.5.15.3 PRESS DOWN [↓] arrow until “BETA HIGH VOLTAGE” is DISPLAYED AND
PRESS “EDIT.”

5.5.15.4 ENTER As-Found value from Step 5.5.7.

5.5.15.5 RECORD As-Left high voltage: ____________

5.5.15.6 PRESS “ENTER” on keypad to accept voltage input.

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

5.5.16 START fan per operating procedure TO-060-006.
Perform Portable Exhauster POR-008 Alarm/Interlock Functional Check

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 “POR-008-VTP-FCV-302 CAM SAMPLE FLOW LO.”

5.6.1 CHECK stack CAM alarm/indicator status and exhauster message view 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>CP-105 CAM Keypad Inside Panel</td>
<td>LIT</td>
</tr>
<tr>
<td>AMBER MALFUNCTION Lamp</td>
<td>CP-105 CAM Keypad Inside Panel</td>
<td>NOT LIT</td>
</tr>
<tr>
<td>CLEAR STROBE Lamp, XA-101</td>
<td>Above Sample Cabinet</td>
<td>NOT FLASHING</td>
</tr>
<tr>
<td>RED STROBE Lamp, XA-301</td>
<td>Above Sample Cabinet</td>
<td>NOT FLASHING</td>
</tr>
<tr>
<td>BELL</td>
<td>ENCL-107 Panel</td>
<td>SILENT</td>
</tr>
<tr>
<td>MONITOR SCREEN ALARM (AMS-4)</td>
<td>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</td>
<td>Alarm Panel View PV-101</td>
<td>ALARM PANEL</td>
</tr>
<tr>
<td>VIEW PV-101</td>
<td>VTP-ENCL-107 Panel</td>
<td>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 page.

5.6.3 CLOSE hand valve 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 CHECK stack CAM alarm/indicator status:

<table>
<thead>
<tr>
<th>ALARM/INDICATOR</th>
<th>LOCATION</th>
<th>STATUS</th>
</tr>
</thead>
<tbody>
<tr>
<td>GREEN READY Lamp</td>
<td>CP-105 CAM Keypad Inside Panel</td>
<td>NOT LIT</td>
</tr>
<tr>
<td>AMBER MALFUNCTION Lamp</td>
<td>CP-105 CAM Keypad Inside Panel</td>
<td>LIT</td>
</tr>
<tr>
<td>CLEAR STROBE Lamp, XA-101</td>
<td>Above Sample Cabinet</td>
<td>FLASHING</td>
</tr>
<tr>
<td>RED STROBE Lamp, XA-301</td>
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<tr>
<td>BELL</td>
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<td>SILENT</td>
</tr>
<tr>
<td>MONITOR SCREEN ALARM (AMS-4)</td>
<td>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 PANEL VIEW PV-101</td>
<td>Alarm Panel View PV-101 VTP-ENCL-107 Panel</td>
<td>“POR-008-VTP-FCV-302 CAM SMP FLOW LO”</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 page.

5.6.6 CONFIRM 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 V-302.

5.6.9 ACKNOWLEDGE “POR-008-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-060-006 or approved work plan.

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

5.6.13 CHECK stack CAM alarm/indicator status and exhauster message view 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>CP-105 CAM Keypad Inside Panel</td>
<td>LIT</td>
</tr>
<tr>
<td>AMBER MALFUNCTION Lamp</td>
<td>CP-105 CAM Keypad Inside Panel</td>
<td>NOT LIT</td>
</tr>
<tr>
<td>CLEAR STROBE Lamp, XA-101</td>
<td>Above Sample Cabinet</td>
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<td>RED STROBE Lamp, XA-301</td>
<td>Above Sample Cabinet</td>
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</tr>
<tr>
<td>BELL</td>
<td>ENCL-107 Panel</td>
<td>SILENT</td>
</tr>
<tr>
<td>MONITOR SCREEN ALARM (AMS-4)</td>
<td>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 page.
5.7 High Radiation Alarm and Fan Interlock

5.7.1 **ENSURE** exhaust fan is operating.

5.7.2 **SIMULATE** HIGH alarm condition:

5.7.2.1 **PRESS** “MENU” on CAM AND

ENTER password to access 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 value recorded.

5.7.2.4 **RECORD** As-Found “GAMMA SUBTRACT FACTOR”

5.7.2.5 **PRESS** “EDIT” AND

ENTER “0” 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.
5.7 High Radiation Alarm and Fan Interlock (Cont.)

WARNING
To avoid radiation exposure direct contact with gamma source MUST be avoided.

5.7.3 USING the extension handle/rod, PLACE AND HOLD gamma source (V-block) at detector head, pointing towards beta detector located at stack in “BETA/GAMMA ENCLOSURE.”

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.

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

5.7.4 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>CP-105 CAM Keypad Inside Panel</td>
<td>LIT</td>
</tr>
<tr>
<td>AMBER MALFUNCTION Lamp</td>
<td>CP-105 CAM Keypad Inside Panel</td>
<td>NOT LIT</td>
</tr>
<tr>
<td>CLEAR STROBE Lamp, XA-101</td>
<td>Above Sample Cabinet</td>
<td>FLASHING</td>
</tr>
<tr>
<td>RED STROBE Lamp, XA-301</td>
<td>Above Sample Cabinet</td>
<td>FLASHING</td>
</tr>
<tr>
<td>BELL</td>
<td>ENCL-107 Panel</td>
<td>RINGING</td>
</tr>
<tr>
<td>MONITOR SCREEN ALARM (AMS-4) NOTIFICATION CHIME &quot;VTP-RA-301&quot;</td>
<td>CP-105 Inside Panel</td>
<td>CHIMING</td>
</tr>
<tr>
<td>CAM BETA HI 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;POR-008-VTP-RA301 BETA HI RAD&quot;</td>
</tr>
</tbody>
</table>
5.7 High Radiation Alarm and Fan Interlock (Cont.)

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 page.

5.7.6 CONFIRM exhaust fan is SHUT DOWN.

5.7.7 ATTEMPT to RESTART exhaust fan per operating procedure TO-060-006 AND

CONFIRM exhaust fan does not start.

5.7.8 REMOVE gamma source from CAM area.

5.7.9 PRESS “ALARM ACK” button twice on CAM (AMS-4).

5.7.10 ACKNOWLEDGE “POR-008-VTP-RA-301 BETA HI RAD” alarm.

5.7.11 ACKNOWLEDGE all secondary alarms displayed in Alarm Panel View PV-101.
5.7 High Radiation Alarm and Fan Interlock (Cont.)

5.7.12 **RESTORE** “GAMMA SUBTRACT FACTOR” to As-Found value:

5.7.12.1 **PRESS** “MENU” key on CAM **AND**

**ENTER** password to access Maintenance Menu.

5.7.12.2 **PRESS** DOWN [↓] arrow until “INSTRUMENT PARAMETERS” is DISPLAYED **AND**

**PRESS** “ENTER.”

5.7.12.3 **PRESS** DOWN [↓] arrow until “GAMMA SUBTRACT FACTOR” is DISPLAYED **AND**

**PRESS** “EDIT.”

5.7.12.4 **ENTER** As-Found value from Step 5.7.2.4.

As-Left value __________.

5.7.12.5 **PRESS** “ENTER” to accept input value.

5.7.12.6 **PRESS** “MENU” twice to return CAM to “OPERATION.”

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

5.7.13 **START** fan per TO-060-006 or approved work plan.
5.7 High Radiation Alarm and Fan Interlock (Cont.)

5.7.14 **CHECK** stack CAM alarm/indicator status and exhauster message view 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>CP-105 CAM Keypad Inside Panel</td>
<td>LIT</td>
</tr>
<tr>
<td>AMBER MALFUNCTION Lamp</td>
<td>CP-105 CAM Keypad Inside Panel</td>
<td>NOT LIT</td>
</tr>
<tr>
<td>CLEAR STROBE Lamp, XA-101</td>
<td>Above Sample Cabinet</td>
<td>NOT FLASHING</td>
</tr>
<tr>
<td>RED STROBE Lamp, XA-301</td>
<td>Above Sample Cabinet</td>
<td>NOT FLASHING</td>
</tr>
<tr>
<td>BELL</td>
<td>ENCL-107 Panel</td>
<td>SILENT</td>
</tr>
<tr>
<td>MONITOR SCREEN ALARM (AMS-4) NOTIFICATION CHIME &quot;VTP-RA-301&quot;</td>
<td>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>

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

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

**RECORD** the Shift Manager’s determination on comment page.
5.8 Exhaust Stack CAM Power Failure

5.8.1 POSITION CAM power switch to “OFF.”

5.8.2 CHECK stack CAM alarm/indicator status and exhauster message view status:

<table>
<thead>
<tr>
<th>ALARM/INDICATOR</th>
<th>LOCATION</th>
<th>STATUS</th>
</tr>
</thead>
<tbody>
<tr>
<td>GREEN READY Lamp</td>
<td>CP-105 CAM Keypad Inside Panel</td>
<td>NOT LIT</td>
</tr>
<tr>
<td>AMBER MALFUNCTION Lamp</td>
<td>CP-105 CAM Keypad Inside Panel</td>
<td>NOT LIT</td>
</tr>
<tr>
<td>CLEAR STROBE Lamp, XA-101</td>
<td>Above Sample Cabinet</td>
<td>FLASHING</td>
</tr>
<tr>
<td>RED STROBE Lamp, XA-301</td>
<td>Above Sample Cabinet</td>
<td>NOT FLASHING</td>
</tr>
<tr>
<td>BELL</td>
<td>ENCL-107 Panel</td>
<td>SILENT</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;POR-008-VTP-RA301 BETA CAM FAIL&quot;</td>
</tr>
</tbody>
</table>

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 page.

5.8.4 **CONFIRM** exhauster has **SHUT DOWN**.

5.8.5 **ACKNOWLEDGE** “POR-008-VTP-RA-301 BETA CAM FAIL” alarm.

5.8.6 POSITION CAM power switch to “ON.”

5.8.7 PRESS “1” button on MV-101 once and “\-” (enter) twice.

5.8.8 **START** fan per TO-060-006 or approved work plan.
5.9 Restoration

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

5.9.1 **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>CP-105 CAM Keypad Inside Panel</td>
<td>LIT</td>
</tr>
<tr>
<td>AMBER MALFUNCTION Lamp</td>
<td>CP-105 CAM Keypad Inside Panel</td>
<td>NOT LIT</td>
</tr>
<tr>
<td>CLEAR STROBE Lamp, XA-101</td>
<td>Above Sample Cabinet</td>
<td>NOT FLASHING</td>
</tr>
<tr>
<td>RED STROBE Lamp, XA-301</td>
<td>Above Sample Cabinet</td>
<td>NOT FLASHING</td>
</tr>
<tr>
<td>BELL</td>
<td>Encl-107 Panel</td>
<td>SILENT</td>
</tr>
<tr>
<td>MONITOR SCREEN ALARM (AMS-4)</td>
<td>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</td>
<td>Alarm Panel View PV-101</td>
<td>ALARM PANEL</td>
</tr>
<tr>
<td>ALARM PANEL VIEW PV-101</td>
<td>VTP-ENCL-107 Panel</td>
<td>VIEW PV-101 CLEAR</td>
</tr>
</tbody>
</table>

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

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

**RECORD** on comment page.
5.9 Restoration (Cont.)

5.9.3 **RESTORE** Exhaust Stack Radiation Monitor components to pre-test configuration

**OR**

5.9.4 **NOTIFY** Shift Manager that testing is COMPLETE.

5.9.4.1 **REQUEST** Shift Manager to notify Environmental that the exhaust stack CAM functional check has been completed.

5.9.5 **CONFIRM** exhauster has SHUT DOWN.

5.9.6 **ACKNOWLEDGE** “POR-008-VTP-RA-301 BETA CAM FAIL” alarm.

5.9.7 **RETURN** radiation source to HPT office.

5.10 Acceptance Criteria

5.10.1 **VERIFY** Sections 5.1 through 5.9 of this procedure have been completed and systems/components performed as specified or all exceptions noted in Comment Page have been resolved.

________________________ / ______________________ / ______________________
Signature Print Date

FWS

5.10.2 **ROUTE** this procedure to Shift Manager for completion of Section 5.11.
5.11 Review

5.11.1 Shift Manager shall REVIEW AND EVALUATE test data for acceptability. Any deficiencies identified and actions taken shall be noted on comment page.

Reviewed by: 

Signature / Print / Date
Shift Manager

5.11.2 System Engineer shall REVIEW AND EVALUATE test data for acceptability. Any deficiencies identified and actions taken shall be noted on comment page.

Reviewed by: 

Signature / Print / Date
System Engineer

5.12 Records

The following records are generated during the performance of this procedure. PM Data Sheets associated with the procedure, are records and are maintained in the work package as record material.

5.12.1 SUBMIT the completed records/work package to the supervisor for record retention.

- Steps 4.1, 4.3.3, 4.3.4, 5.1.1, 5.2.2, 5.2.5, 5.3.2, 5.3.5, 5.4.2, and 5.4.6
- Steps 5.5.7 and 5.5.15.5
- Steps 5.7.2.4 and 5.7.12.4
- Steps 5.10.1, 5.11.1, and 5.11.2
- Comment Page
- Functional Check Signature Sheet.

The record custodian identified in the Company Level Records Inventory and Disposition Schedule (RIDS) is responsible for record retention in accordance with TFC-BSM-IRM_DC-C-02.
Perform Portable Exhauster POR-008 Alarm/Interlock Functional Check

Comment Page

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                     Date
Commenter

ENVIRONMENTAL RECORD
Functional Check Signature Sheet

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>
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<tbody>
<tr>
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