Perform Functional Check Of 241-AP Wireless Leak Detectors

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Change History (≤ Last 5 Rev-Mods)

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<td>10/18/2017</td>
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<td>Added Note after Step 5.1.7, Modified Step 5.1.8, Added Note after Step 5.1.10, Modified Step 5.1.11, Removed “STA from Steps 5.1.12 and 5.2.19.</td>
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<td>A-3</td>
<td>09/06/2017</td>
<td>Engineering Requested Change</td>
<td>Reword Title. Add to Section 1.2. Add to Section 4.2. Add New Section 5.4. Update Records Section 5.8 to comply with Writer's Standard.</td>
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<tr>
<td>A-2</td>
<td>08/23/2017</td>
<td>Maintenance request</td>
<td>Added Note “May take up to 5 minutes for alarm to clear once battery has been installed.” to step 5.1.6, 5.2.8, and 5.3.8. Deleted omitted substeps in accordance with the Writers Guide.</td>
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<td>A-1</td>
<td>08/25/2016</td>
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Type | Document No. | Rev/Mod | Release Date | Page |
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REFERENCE | 3-LDD-702 | A-6 | 06/07/2018 | 1 |
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5.5 Restoration

5.6 Acceptance Criteria

5.7 Review

5.8 Records

Figure 1 – Encasement Leak Detector Assembly

Figure 2 – Encasement Leak Detector Assembly

Figure 3 – Seal Pot SP-380 & SP 480 Leak Detector Assembly
1.0 PURPOSE AND SCOPE

1.1 Purpose

This procedure provides instructions for testing the 241-AP wireless leak detectors.

1.2 Scope


2.0 INFORMATION

NONE

3.0 PRECAUTIONS AND LIMITATIONS

3.1 Personnel Safety

3.1.1 IF a lock and tag is required during the performance of this procedure, comply with the DOE-0336, Hanford Site Lockout/Tagout Procedure.

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

3.1.3 Contact the Industrial Hygienist for appropriate IHSP.
3.2 Radiation and Contamination Control

3.2.1 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.

3.2.2 The opening of any system or component within a Radiological Area requires the presence of a Health Physics Technician to verify contamination control.

3.3 Environmental Compliance

The Central Shift Office must be notified in the event of a leak or a spill in accordance with TFC-ESHQ-ENV_FS-C-01, Environmental Notification.
4.0 PREREQUISITES

4.1 Special Tools, Equipment, and Supplies

The following supplies may be needed to perform this procedure:

- Means of communication (i.e. radios, cell phone)
- Approximately 10cc of tap water
- Ladder
- Spare Battery: Black Power Module, SmartPower Solutions module number 701PBKKF (Part number 00753-9220-0001)
- Jumper wire and banana plugs.

4.2 Performance Documents

The following documents may be needed to perform this procedure:

- DOE-0336, Hanford Site Lockout/Tagout Program
- DOE-0359, Hanford Site Electrical Safety Program
- H-14-109466, Sht 1, AP Tank Farm Exhauster 3” DR-M9 Riser-029-Tie-In.
- H-14-109466, Sht 2, AP Tank Farm Exhauster 3” DR-M9 Riser-029-Tie-In
- H-14-109436, Sht 1, AP241-VTP-Exhauster Instrument Location Plan
- H-14-109436, Sht 2, AP241-VTP-Exhauster Sections and Details
- H-14-109436, Sht 3, AP241-VTP-Exhauster Sections and Details
- H-14-109436, Sht 4, AP241-VTP-Exhauster Sections and Details
- H-14-042603 Sheets 1 thru 10, and 15.

4.3 Field Preparation

The following conditions must be complete before this procedure may commence:

4.3.1 REQUEST Operations to configure system to allow performance of this procedure.

4.3.2 IF Lockout/Tagout is required, ENSURE lockout/tagout and overlocking requirements have been satisfied per DOE-0336, Hanford Site Lockout/Tagout Procedure,

OR

IF Lockout/tagout was applied, ENSURE lockout/tagout and overlocking requirements have been satisfied per DOE-0336, Hanford Site Lockout/Tagout Procedure.
5.0 PROCEDURE

NOTE- The subsections within 5.0 can be worked independently, concurrently, or in parallel with other sections as directed by the FWS with those directions recorded on work record or Comments Section of Data Sheet.

5.1 Functional Check of AP241-VTP-LDA-270 Encasement Leak Detector

5.1.1 CHECK that AP241-VTP-LDA-270 is powered up and there are no faults AND

RECORD results on the Data Sheet.

5.1.2 CHECK that AP271-TMAC-WBW-002 Rosemount Smart Wireless Gateway is operable in TFMCS AND.

RECORD results on the Data Sheet.

5.1.3 REMOVE battery from AP241-VTP-LDSTA-270.

5.1.4 CHECK on TFMCS HMI that AP241-VTP-LDA-270 goes into alarm.

5.1.5 RECORD results on the Data Sheet.

NOTE - May take up to 5 minutes for alarm to clear once battery has been installed.

5.1.6 INSTALL battery in AP241-VTP-LDSTA-270.

5.1.7 CHECK on TFMCS HMI that alarm on AP241-VTP-LDA-270 clears.

5.1.8 RECORD results on Data Sheet.

NOTE - The Test Port for AP241-LDSTA-270 is located in AP106-WST-RISER-029.

5.1.9 POUR a small amount of water into AP241-VTP-LDE-270 Test Port (Figure 1 and Figure 2).

5.1.10 CHECK on TFMCS HMI that AP241-VTP-LDSTA-270 goes into alarm

5.1.11 RECORD results on Data Sheet.

NOTE - The V-270 Drain Plug Actuator is emptied by removing the four bolts located on the top of the assembly and lifting the cap.

5.1.12 REMOVE water from AP241-VTP-LDE-270 by opening the 2” drain plug actuator completely (Figure 1 and Figure 2).
5.1 **Functional Check of AP241-VTP-LDA-270 Encasement Leak Detector (Cont.)**

**NOTE** - Alarm will not clear until all of test water has drained and is not in contact with leak detector probe.

5.1.13 **CHECK** on TFMCS HMI that alarm on AP241-VTP-LD-270 has cleared.

5.1.14 **RECORD** results on Data Sheet.
5.2 Functional Check of AP241-VTP-LDA-380 Primary Exhauster Seal Pot Leak Detector

5.2.1 **CHECK** that AP241-VTP-LDA-380 is powered up and there are no faults **AND**

**RECORD** results on the Data Sheet.

5.2.2 **CHECK** that AP271-TMAC-WBW-002 Rosemount Smart Wireless Gateway is operable in TFMCS **AND**

**RECORD** results on the Data Sheet.

5.2.3 **FROM** TFMCS HMI Alarm Screen, **CHECK** that alarm tag AP241-VTP-LDA-380 is not in alarm.

5.2.4 **RECORD** results on the Data Sheet.

5.2.5 **REMOVE** battery from AP241-VTP-LDSTA-380.

5.2.6 **CHECK** on TFMCS HMI that AP241-VTP-LDA-380 goes into alarm.

5.2.7 **RECORD** results on the Data Sheet.

**NOTE** - May take up to 5 minutes for alarm to clear once battery has been installed.

5.2.8 **INSTALL** battery in AP241-VTP-LDSTA-380.

5.2.9 **CHECK** on TFMCS HMI that alarm on AP241-VTP-LDA-380 clears.

5.2.10 **RECORD** results on Data Sheet.

5.2.11 **MEASURE** the distance from lowest point under the probes and the bottom of the probes.

5.2.12 **RECORD** distance on Data Sheet.
5.2 Functional Check of AP241-VTP-LDA-380 Primary Exhauster Seal Pot Leak Detector (Cont.)

5.2.13 LOOSEN straps holding leak detector assembly AND LIFT leak detector assembly approximately 2-4 inches.

5.2.14 TIGHTEN straps holding leak detector assembly.

5.2.15 POUR approximately 3/4" of water in a small container and place container under leak probes (Figure 3)

5.2.16 CHECK on TFMCS HMI that AP241-VTP-LDA-380 goes into alarm

5.2.17 RECORD results on Data Sheet.

5.2.18 REMOVE water and container from under leak probes (Figure 3).

NOTE - Alarm will not clear until all of test water is not in contact with leak detector probe and TFMCS HMI have refreshed. (HMI Refresh rate 8 seconds)

5.2.19 CHECK on TFMCS HMI that alarm on AP241-VTP-LD-380 has cleared.

5.2.20 RECORD results on Data Sheet.

5.2.21 LOOSEN straps holding leak detector assembly and reposition assembly to the distance recorded in Step 5.2.12 above AND TIGHTEN straps holding leak detector assembly.

5.2.22 RECORD distance on Data Sheet.
5.3 Functional Check of AP241-VTP-LDA-480 Primary Exhauster Seal Pot Leak Detector

5.3.1 **CHECK** that AP241-VTP-LDA-480 is powered up and there are no faults **AND**
**RECORD** results on the Data Sheet.

5.3.2 **CHECK** that AP271-TMAC-WBW-002 Rosemount Smart Wireless Gateway is operable in TFMCS **AND**
**RECORD** results on the Data Sheet.

5.3.3 **FROM** TFMCS HMI Alarm Screen, **CHECK** that alarm tag AP241-VTP-LDA-480 is not in alarm.

5.3.4 **RECORD** results on the Data Sheet.

5.3.5 **REMOVE** battery from AP241-VTP-LDSTA-480.

5.3.6 **CHECK** on TFMCS HMI that AP241-VTP-LDA-480 goes into alarm.

5.3.7 **RECORD** results on the Data Sheet.

**NOTE** - May take up to 5 minutes for alarm to clear once battery has been installed.

5.3.8 **INSTALL** battery in AP241-VTP-LDSTA-480.

5.3.9 **CHECK** on TFMCS HMI that alarm on AP241-VTP-LDA-480 clears.

5.3.10 **RECORD** results on Data Sheet.

5.3.11 **MEASURE** the distance from lowest point under the probes and the bottom of the probes.

5.3.12 **RECORD** distance on Data Sheet.

5.3.13 **LOOSEN** straps holding leak detector assembly **AND**
**LIFT** leak detector assembly approximately 2-4 inches.

5.3.14 **TIGHTEN** straps holding leak detector assembly.

5.3.15 **POUR** approximately 3/4" of water in a small container and place container under leak probes (Figure 3)

5.3.16 **CHECK** on TFMCS HMI that AP241-VTP-LDA-480 goes into alarm
5.3 Functional Check of AP241-VTP-LDA-480 Primary Exhauster Seal Pot Leak Detector (Cont.)

5.3.17 RECORD results on Data Sheet.

5.3.18 REMOVE water and container from under leak probes (Figure 3).

NOTE - Alarm will not clear until all of test water is not in contact with leak detector probe and TFMCS HMI have refreshed. (HMI Refresh rate 8 seconds)

5.3.19 CHECK on TFMCS HMI that alarm on AP241-VTP-LDSTA-480 has cleared.

5.3.20 RECORD results on Data Sheet.

5.3.21 LOOSEN straps holding leak detector assembly and reposition assembly to the distance recorded in Step 5.3.12 above AND TIGHTEN straps holding leak detector assembly.

5.3.22 RECORD distance on Data Sheet.
Perform Functional Check Of 241-AP Wireless Leak Detectors


NOTE - The performance of this functional check requires work to occur simultaneously at the leak detector stations inside the farm and at TFMCS in the instrument building. Work at the leak detector stations will include removing/replacing batteries, installing jumpers and lifting wires. TFMCS will be monitored for alarm activation and clearing.

- Section 5.4 is performed for both an annual and a five year PM. The five year PM will replace the battery instead of reinstalling the current battery.

5.4.1 CHECK that the wireless leak detector is powered up and there are no faults AND

RECORD results on the Data Sheet. (Item 1)

5.4.1.1 IF faults are found, CONTACT FWS and resolve before proceeding.

NOTE - If gateway is inoperable, the HMI will display a black circle with the letters “UNK” crossed out.

5.4.2 CHECK that AP271-TMAC-WBW-002 Rosemount Smart Wireless Gateway is operable in TFMCS HMI AND.

RECORD results on the Data Sheet. (Item 2)

5.4.2.1 IF the gateway is inoperable, CONTACT FWS and resolve before proceeding.

5.4.3 REMOVE battery from the wireless leak detector by UNSCREWING the back half of the transmitter AND

UNPLUGGING the battery.

NOTE – A loss of communications alarm is represented by a red X through the green NORM circle.

5.4.4 CHECK on TFMCS HMI that the leak detector being tested has a loss of communications alarm.

5.4.5 RECORD results on the Data Sheet. (Item 3)
Perform Functional Check Of 241-AP Wireless Leak Detectors


5.4.6 IF performing the five year PM, REPLACE the battery in the wireless leak detector (Item 3.5).

5.4.7 IF performing the annual PM, REINSTALL battery into the wireless leak detector.

NOTE - May take up to 10 minutes for alarm to clear once battery has been installed.

5.4.8 CHECK on TFMCS HMI that the loss of communications alarm for the detector being tested clears.

5.4.9 RECORD results on Data Sheet. (Item 4)

NOTE - The phoenix knife contacts are located in leak detector junction box mounted on the pole.

5.4.10 LIFT the phoenix contact knife switch on terminal 1.

5.4.11 CHECK on TFMCS HMI that the leak detector being tested has a FAIL alarm. A fail alarm is represented by an orange “FAIL” circle.

5.4.12 RECORD results on Data Sheet. (Item 5)

5.4.13 REINSERT the knife switch on terminal 1.
Perform Functional Check Of 241-AP Wireless Leak Detectors


5.4.14 CHECK on TFMCS HMI that the FAIL alarm on the detector being tested has cleared.

5.4.15 RECORD results on Data Sheet. (Item 6)

5.4.16 LIFT the phoenix contact knife switch on terminal 4.

5.4.17 CHECK on TFMCS HMI that the leak detector being tested has a FAIL alarm. A fail alarm is represented by an orange “FAIL” circle.

5.4.18 RECORD results on Data Sheet. (Item 7)

5.4.19 REINSERT the knife switch on terminal 4.

5.4.20 CHECK on TFMCS HMI that the FAIL alarm on the detector being tested has cleared.

5.4.21 RECORD results on Data Sheet. (ITEM 8)

5.4.22 INSTALL a wire jumper across terminals 1 and 4 in the leak detector junction box mounted on the pole on top of the concrete base.

5.4.23 CHECK on TFMCS HMI that the detector being tested goes into a LEAK alarm. A leak is represented by an orange “LEAK” circle.

5.4.24 RECORD results on Data Sheet. (Item 9)

5.4.25 REMOVE the wire jumper from terminals 1 and 4.

5.4.26 CHECK on TFMCS HMI that the LEAK alarm on the detector being tested has cleared.

5.4.27 RECORD results on Data Sheet. (Item 10)
5.5 Restoration

5.5.1 IF any problems were encountered with functional check, INFORM FWS and Shift Manager/OE.

5.5.2 ENSURE equipment system restoration by observing indications are consistent with expected conditions.

5.5.3 NOTIFY Shift Manager/OE, Master Control System Operator and Tank Monitor and Control System Operator that 241-***** leak detector functional checks are complete.

5.6 Acceptance Criteria

Acceptance Criteria has been met when steps in this procedure have been satisfactorily performed and As-Left values meet the specifications and tolerance(s) per the Data Sheet.

5.7 Review

5.7.1 INFORM FWS test is complete.

5.7.2 FWS REVIEW AND ENSURE the following:

- Completed Data Sheets meet the acceptance criteria.
- Comments sections are filled out appropriately.
- Work requests needed as a result of this procedure are identified and generated.
- Work request number(s) of any work documents generated as a result of this procedure, are recorded in the Comments/Remarks section of the Data Sheet, as applicable.

5.8 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 Records Inventory and Disposition Schedule (RIDS) is responsible for record retention in accordance with TFC-BSM-IRM_DC-C-02.
Perform Functional Check Of 241-AP Wireless Leak Detectors

Figure 1 – Encasement Leak Detector Assembly

Test Port
Perform Functional Check Of 241-AP Wireless Leak Detectors

Figure 2 – Encasement Leak Detector Assembly

2” Valve Actuator

Test Port

Drain
Perform Functional Check Of 241-AP Wireless Leak Detectors

Figure 3 – Seal Pot SP-380 & SP 480 Leak Detector Assembly

Distance from bottom of probes to lowest point