Perform Release Surveys for Material and Equipment

Tank Farm Plant Operating Procedure

RADCON

USQ # N/A-4

<table>
<thead>
<tr>
<th>Rev-Mod</th>
<th>Release Date</th>
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<th>Summary of Changes</th>
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<tr>
<td>A-3</td>
<td>05/16/2018</td>
<td>Radcon request</td>
<td>Step 5.2.3.3 and Table 3, modified step and table to reflect limit 5 seconds and not 15. Added note above Section 5.1.</td>
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<td>A-2</td>
<td>10/17/2017</td>
<td>Radcon request</td>
<td>Deleted Large Area Swipes from Section 4.1. rewrote Step 5.1.5 for clarity. Moved NOTE from above Step 5.2.2.2 to above Step 5.2.2.1. Added &quot;See Table 3 to NOTE. Removed from Fig. 1 - &quot;Perform Sentinel Measurements if desired&quot;</td>
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<tr>
<td>A-1</td>
<td>06/15/2017</td>
<td>Rad Con request to clarify</td>
<td>Clarified and modified survey steps to simplify work execution</td>
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<tr>
<td>A-0</td>
<td>06/30/2016</td>
<td>New procedure</td>
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1.0 PURPOSE AND SCOPE

1.1 Purpose

This procedure provides the Health Physics Technician (HPT) with a method for evaluating Materials and Equipment (M&E) exiting a Contamination Area (CA), High Contamination Area (HCA), Airborne Radioactivity Area (ARA) for unrestricted use in accordance with DOE 458.1 to a standard survey method for performing release surveys at the 67% confidence level and performing surveys via a Release Survey Plan (RSP) developed in accordance with TFC-ESHQ-RP_MON-C-28.

1.2 Scope

This procedure applies to Materials and Equipment (M&E) that may be considered for clearance within the 200 East/200 West Tank Farms and associated facilities:

- Metal currently in a radiological area, CA, HCA, ARA, RA, HRA, or VHRA, may not be released for recycling with the following exceptions.
  - Metal items (CA, HCA, ARA, RA, HRA, or VHRA) that meet all applicable authorized limits, providing the item will continue to be used in its current form and its current intended function regardless of possible future transfer of the metal leading to its ultimate recycling
  - Materials like light bulbs, batteries etc., that are in radiological areas that are routinely recycled, may still be released for recycle.

The following items are outside the scope of this procedure:
- Real property (land and structures)
- Personal Items, as defined in Section 2.1
- Material potentially contaminated in volume
- Release of metal for recycling
- Personnel contamination monitoring/frisking surveys
- Conditional release of M&E.

The following items require use of an RSP prepared in accordance with TFC-ESHQ-RP_MON-C-28:
- M&E involved with tank intrusive work in the tanks or components identified in Table 1 or Table 2
- M&E with any inaccessible areas that may not be represented by accessible areas
- M&E classified in part or whole as likely to be contaminated in excess of authorized limits (95% confidence survey)
- M&E where process or historical information to evaluate the M&E is not readily available.
- Tritium-contaminated M&E
2.0 INFORMATION

2.1 Terms and Definitions

- Likely to be contaminated - M&E that have a probable potential for radioactive contamination in excess of the Authorized Limits
- Material and Equipment (M&E) - Items considered for clearance that include metals, concrete, dispersible bulk materials, tools, equipment, piping, conduit, furniture, solids, liquids, and gases in containers, etc.
- Potentially Contaminated. M&E exiting a CA, HCA or ARA
- Personal Item. An item that was never hand-held and remains on the person after completing the PPE doffing instructions at the step-off-pad
- Unlikely to be contaminated - M&E that have a low (unexpected) potential for radioactive contamination in excess of the Authorized Limits
- Detectable contamination, with portable instruments, is defined as audible increase above background
- Process knowledge - This is information concerning the characteristics, history of prior use, and inherent radioactivity of the M&E being considered for clearance (release). Process knowledge is obtained through experience with, or a review of or knowledge of the operations where M&E have been located and the processes where the M&E were involved
- Tank Farms Proper - Those 10 areas typically described as “Tank Farms” and are grouped as follows: A-Complex, AN-Tank Farms, AP Tank Farms, AW-Tank Farms, B-Tank Farms, BX/BY -Tank Farms, C-Farm, S-Complex (S,SX,SY), T-Complex (TX-TY), U-Tank Farm. These groups of tank farms are typically bounded by chain-link fences.
2.2 General Information

2.2.1 Table 1 provides a list of tanks which require Hard-To-Detect (HTD) surveys for tank waste intrusive activities.

2.2.2 Table 2 provides ancillary tanks and components requiring HTD surveys for intrusive work.

2.2.3 Table 3 provides a HPT quick reference of the 67% release survey methodology.

2.2.4 Figure 1 provides a flowchart of the general evaluation process.

2.2.5 Standard release surveys shall include a technical smear survey to demonstrate compliance with the removable contamination limits. A Large Area Wipe (LAW) may not be used as a part of the release process.

2.2.6 If the radiological control project or program director approves a characterization study of the facility, area, or activity that identifies that "alpha only" or "beta-gamma only" contamination surveys are sufficient for release of material and equipment to uncontrolled areas, omit the other type of survey. However, if contamination is detected during single radiation type release surveys, perform and document both alpha and beta surveys.

2.2.7 If dual surveys are required only during intrusive work and alpha is not detected during job coverage surveys, then alpha surveys are not required for M&E standard release surveys.

2.2.8 Dual surveys are required for personnel and M&E when excavating outside of a tank farm proper.

2.2.9 Porous surfaces can be evaluated based on status of non-porous surfaces and HPTs evaluation of the representativeness of the non-porous to porous surfaces.

2.2.10 While performing surveys, if the beta-gamma audible count rate increases above background or the alpha instrument "pops," investigate by pausing over the suspected area for at least five seconds. If performing a scan survey, re-survey approximately 13 cm (5 in.) of the previous path at a reduced rate.
2.2 General Information (Cont.)

2.2.11 The maximum background for beta-gamma surveys is 150 cpm for GM 15.5 cm² probes and 500 cpm for 2360 100 cm² probes. The maximum background for alpha surveys is 3 cpm for all probes.

2.2.12 Portable instrument information is given to evaluate for beta-gamma and alpha. If a dual survey exemption is in effect, use the applicable technique. If contamination is detected, surveys for beta-gamma and alpha are required.

2.2.13 Perform contamination surveys in the following order:

- Direct surveys, then
- Smear surveys.

There may be cases where performing smear surveys first are necessary. For example, if a large number of workers are exiting an egress point, it may be warranted to perform smear surveys first and move items to a RMA where they can have direct surveys performed to keep the egress point flowing.

2.2.14 Smear surveys and direct static surveys should focus on areas most likely to be contaminated based on M&E design and use in the area.

2.2.15 Personal items are frisked as part of the manual frisk or APM use if the item remains attached to the person, or by the HPT if the item is voluntarily removed from the person.

2.2.16 Released surveys performed for materials and equipment with a current RSP must be performed in accordance with the RSP.
3.0 PRECAUTIONS AND LIMITATIONS

3.1 Personnel Safety

3.1.1 Follow General Hazard Analysis requirements.

3.1.2 Use proper ergonomics to lift or manipulate materials and equipment.

3.1.3 Obtain guidance from the project Industrial Hygienist or Safety & Health staff to handle hazardous chemical substances.

3.2 Radiation and Contamination Control

An approved radiological work permit (RWP) is required. If radiological conditions or work performed falls outside the scope of the RWP, all work activities must be discontinued until a new or revised RWP has been issued in accordance with TFC-ESHQ-RP_RWP-C-03.
4.0 PREREQUISITES

4.1 Special Tools, Equipment, and Supplies

The following supplies may be needed to perform this procedure:
- Contamination monitoring equipment
- Smears
- Yellow bags
- Tape
- RAM labels

4.2 Performance Documents

The following documents may be needed to perform this procedure:
- TFC-ESHQ-RP_MON-C-27, Documentation of Radiological Survey Using Survey Simple
- Release Survey Plan

4.3 Field Preparation

NOTE - The initial determination of contamination potential of the M&E (i.e., unlikely contaminated or not potentially contaminated) is based on area posting where equipment was used, type of use, and the results of work process measurements taken.

- If using an RSP, ENTER the procedure at Section 5.3

4.3.1 EVALUATE the existing process information for M&E exiting CA, HCA or ARA for being unlikely to be contaminated or requiring a RSP using the following criteria:
- Job-coverage measurements and processes (item, area, or job) provides sufficient knowledge of likelihood of contamination
- Use of item (used for work or not, or cover during work)
- Accessible surfaces are representative of inaccessible surfaces, including porous surfaces
- Surfaces are clean and free of materials that could affect survey results
- The item is not complex in structure or operation
- Item has not been decontaminated
- Not used for intrusive work for any item in Table 1 or Table 2.
4.3 Field Preparation (Cont.)

4.3.2 **IF** the evaluation performed in Step 4.3.1 indicates a potential to be likely contaminated or affects the ability to complete the survey, **PERFORM** the following:

4.3.2.1 **CONTROL** the M&E as radioactive material/waste.

4.3.2.2 **NOTIFY** management.

4.3.2.3 **EXIT** this procedure.
5.0 PROCEDURE

NOTE - Tasks in this procedure performed by Health Physics personnel may be performed concurrently as long as all steps are completed.

- In order to standardize survey techniques for use with different instruments, in some cases the most limiting parameter was selected (i.e., slowest scan speed or longest count time)

- Direct surveys should be performed first, with smear surveys to follow. There may be cases where performing smear surveys first are necessary. For example, if a large number of workers are exiting an egress point, it may be warranted to perform smear surveys first and move items to a RMA where they can have direct surveys performed to keep the egress point flowing.

Special Instructions

If dual surveys are required only during intrusive work and alpha is not detected during job coverage surveys, then alpha surveys are not required for M&E standard release surveys.

Smears evaluated for clearance of material and equipment should be dry.

5.1 General Survey Information for 67% Survey

5.1.1 IF an approved characterization study of the facility, area, or activity identifies that “alpha only” or “beta-gamma only” contamination surveys are sufficient for release to uncontrolled areas, OMIT the other type of survey.

5.1.2 IF contamination is detected during single radiation type release surveys, PERFORM AND DOCUMENT both alpha and beta surveys.

5.1.3 IF performing a beta-gamma survey, ENSURE the following maximum background:
  • 150 cpm for GM probes
  • 500 cpm for 100 cm² probes.

5.1.4 IF performing an alpha survey, ENSURE the maximum background is 3 cpm.

5.1.5 IF item is (smaller than the instrument probe area), static surveys will be used in lieu of scan surveys.
5.2 Standard 67% Release Survey

5.2.1 Direct Scan Survey

5.2.1.1 SCAN a minimum 100% of the accessible surfaces paying attention to areas most probable to be contaminated.

5.2.1.2 IF audible count rate increases above background, PAUSE over the suspected area for at least five seconds AND RE-SURVEY approximately 13 cm (5 in.) of the previous path at a reduced rate.

Beta-Gamma

5.2.1.3 ENSURE scan speed does not exceed 2 inches per second with the probe-to-surface distance within \( \frac{1}{4} \) inch.

Alpha

5.2.1.4 ENSURE scan speed does not exceed 1 inch per second with the probe to surface distance within \( \frac{1}{4} \) inch.

2360 Dual Alpha-Beta Mode

5.2.1.5 ENSURE scan speed does not exceed 1 inch per second with the probe-to-surface distance within \( \frac{1}{4} \) inch.

5.2.1.6 IF contamination above background is detected, GO TO Step 5.4.1.
5.2 Standard 67% Release Survey (Cont.)

5.2.2 Direct Static Survey

NOTE - No beta-gamma static surveys are necessary if scan was performed, since the scan minimum detectable activity (MDA) meets the Average Total contamination criteria. (See Table 3)

5.2.2.1 PERFORM static surveys of the accessible surfaces focusing on areas most likely to be contaminated based on M&E evaluation.

**Alpha**

5.2.2.2 ENSURE one static survey per ft² with the probe-to-surface distance within ¼ inch using the following criteria:

- 50 cm² Portable Alpha Meter (PAM): 10-second static count time
- 100 cm² PAM: 5-second static count time
- 2360 with 43-93: 5-second static count time.

**2360 Dual Alpha-Beta Mode**

5.2.2.3 ENSURE one 5-second static survey per ft² with the probe-to-surface distance ¼ inch.

5.2.2.4 IF contamination above background is detected, GO TO Step 5.4.1.
5.2 Standard 67% Release Survey (Cont.)

5.2.3 Smear Survey

5.2.3.1 **PERFORM** one technical smear per m$^2$ over the accessible surface area, focusing on areas most likely to be contaminated based on M&E evaluation.

5.2.3.2 **EVALUATE** the smear using TF-RC-021, or portable instruments as follows:

**Beta-Gamma**

5.2.3.3 **EVALUATE** each smear for at least 5 seconds for GM or for 2360 with probe to-surface distance within $\frac{3}{8}$ inch.

**Alpha**

5.2.3.4 **EVALUATE** each smear for at least 60 seconds with probe to surface distance within $\frac{3}{4}$ inch.

**2360 Dual Alpha-Beta Mode**

5.2.3.5 **EVALUATE** each smear for at least 60 seconds with probe-to-surface distance within $\frac{3}{4}$ inch.

5.2.3.6 **IF** contamination above background is detected, **GO TO** Step 5.4.1.
5.3 Performing a Survey by RSP

5.3.1 **OBTAIN** a copy of the approved RSP

5.3.2 **PERFORM** surveys in accordance with RSP

5.3.3 **DISPOSITION** material in accordance with RSP

5.3.4 **DOCUMENT** survey results in accordance with TFC-ESHQ-RP_MON-C-27.
5.4 Disposition of M&E for Standard Release Survey

5.4.1 IF contamination above background is detected, **PERFORM** the following:

5.4.1.1 **QUANTIFY** contamination levels and locations for beta-gamma and alpha.

5.4.1.2 **MARK AND/OR CONTROL** M&E as radioactive material.

5.4.1.3 **DOCUMENT** survey results in accordance with TFC-ESHQ-RP_MON-C-27.

5.4.2 IF no contamination above background is detected, **PERFORM** the following:

5.4.2.1 **REMOVE** any radiological labels,

OR

**DEFACE** those labels that cannot be removed.

5.4.2.2 **MOVE** the M&E to an uncontaminated area.

5.4.2.3 **DOCUMENT** the survey results in accordance with TFC-ESHQ-RP_MON-C-27.

5.5 Records

**NOTE** - No records are generated during the performance of this procedure.

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 Release Surveys for Material and Equipment

Table 1 - Tanks Requiring HTD Surveys For Waste Intrusive Work

Tank waste intrusive work in these tanks requires a release survey plan to account for HTD fractions even if the M&E is classified as unlikely contaminated.

<table>
<thead>
<tr>
<th>Tank</th>
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<tbody>
<tr>
<td>241-B-203</td>
</tr>
<tr>
<td>241-T-112</td>
</tr>
<tr>
<td>241-T-202</td>
</tr>
<tr>
<td>241-T-203</td>
</tr>
<tr>
<td>241-T-204</td>
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</table>


Table 2 - Ancillary Tanks and Components Requiring HTD Surveys For Intrusive Work

<table>
<thead>
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<th>Tank</th>
<th>Tank</th>
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<tr>
<td>204-AR-TK-1</td>
<td>241-ER-311</td>
</tr>
<tr>
<td>240-S-302</td>
<td>244-AR-Vault</td>
</tr>
<tr>
<td>241-A-350</td>
<td>244-CR-Vault</td>
</tr>
<tr>
<td>241-S-304</td>
<td>219-S-102</td>
</tr>
<tr>
<td>244-TX-DCRT</td>
<td>244-S-DCRT</td>
</tr>
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</table>

244-BX DCRT, 241-AZ-301, and UX-302A have been removed from HTD surveys. Any other ancillary tank not listed requires HTD surveys for intrusive work.

Components

Any vapor-condensing component located in a DST Ventilation Tank Primary (VTP) system such as drain lines, seal loops and seal pots requires HTD surveys for intrusive work.

**Table 3 - Standard Clearance (Release) Survey Method**

<table>
<thead>
<tr>
<th>67% Standard Survey for M&amp;E “Unlikely” Contaminated</th>
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<tbody>
<tr>
<td><strong>Technical Smears:</strong> at least 1 per m²</td>
</tr>
<tr>
<td>$\beta\gamma$ – GM count $\geq$ 5 seconds @ $\leq \frac{1}{4}”$</td>
</tr>
<tr>
<td>$\beta\gamma$ – 2360 count $\geq$ 5 seconds @ $\leq \frac{1}{4}”$</td>
</tr>
<tr>
<td><strong>Scan:</strong> =100% of accessible surfaces</td>
</tr>
<tr>
<td>$\beta\gamma$ – scan speed $\leq 2”/second$ @ $\leq \frac{1}{4}”$</td>
</tr>
<tr>
<td>$\alpha$ – scan speed $\leq 1”/second$ @ $\leq \frac{1}{4}”$</td>
</tr>
<tr>
<td><strong>Static:</strong> $\beta\gamma$ not necessary, $\alpha$ at least 1/ft²</td>
</tr>
<tr>
<td>$\beta\gamma$ – scan MDA meets requirement, $\alpha$ – 50 cm² probe count 10 sec. @ $\leq \frac{1}{4}”$</td>
</tr>
<tr>
<td>if performed, count $\geq$ 5 sec @ $\leq \frac{1}{4}”$</td>
</tr>
<tr>
<td><strong>DOE O 458.1 Clearance (Release) Criteria:</strong></td>
</tr>
<tr>
<td>Total dpm/100 cm²</td>
</tr>
<tr>
<td>$\beta\gamma$</td>
</tr>
<tr>
<td>$&lt; 5000$</td>
</tr>
</tbody>
</table>

**67% Standard Survey for M&E Unlikely Contaminated**

**Potentially Contaminated:** M&E exiting a CA, HCA or ARA

**Unlikely Contaminated:** M&E that have a low (unexpected) potential for radioactive contamination in excess of the Authorized Limits.

**Likely Contaminated:** M&E that have a probable potential for radioactive contamination in excess of the Authorized Limits.

(This rectangle is approximately 100 cm²)
Figure 1 – Clearance (Release) Flowchart

Assess Posting, Process and Historical Knowledge

Evaluate Current Job Status / Events

Classify contamination potential and release methodology

Unlikely Contaminated

Likely Contaminated

Unlikely
Survey 100% of accessible area

Likely
RSP Survey area variable

RSP
Survey area variable

67% Confidence

Variable Confidence

95% Confidence

Evaluate results

Release M&E

Control as Rad

Management Input Establishes Minimum Survey Requirements

HPT Input Final Determination of Survey Methodology