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Title: RCT Continuing Training: Item Release and RAM Control

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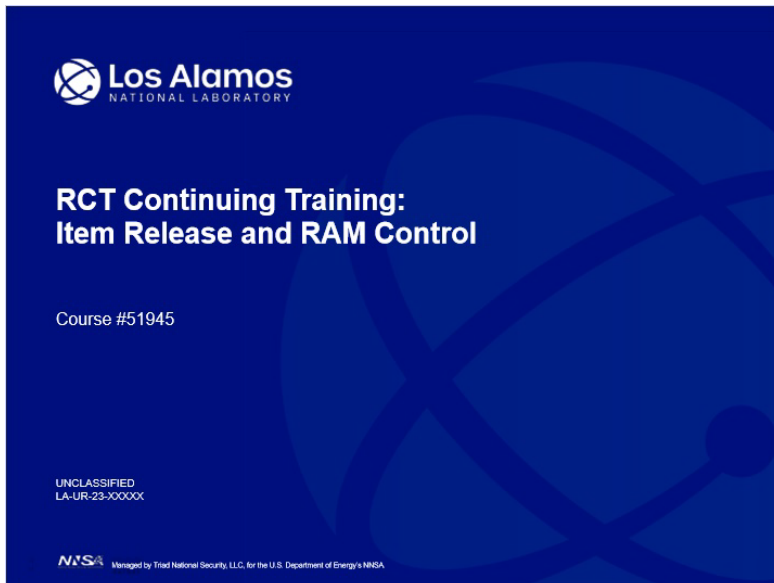
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RCT Continuing Training:

Item Release and RAM Control

1. RCT Continuing Training Item Removal

1.1 Item Removal Training



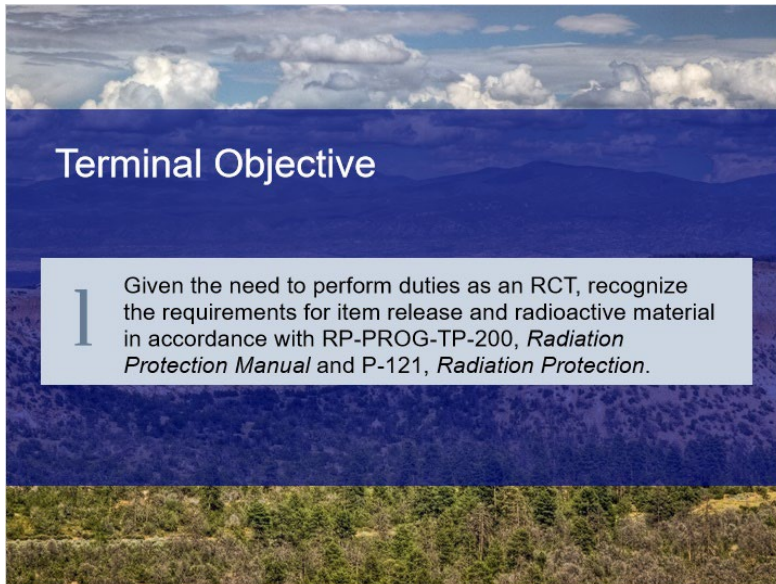
Notes:

1.2 WELCOME LAYOUT

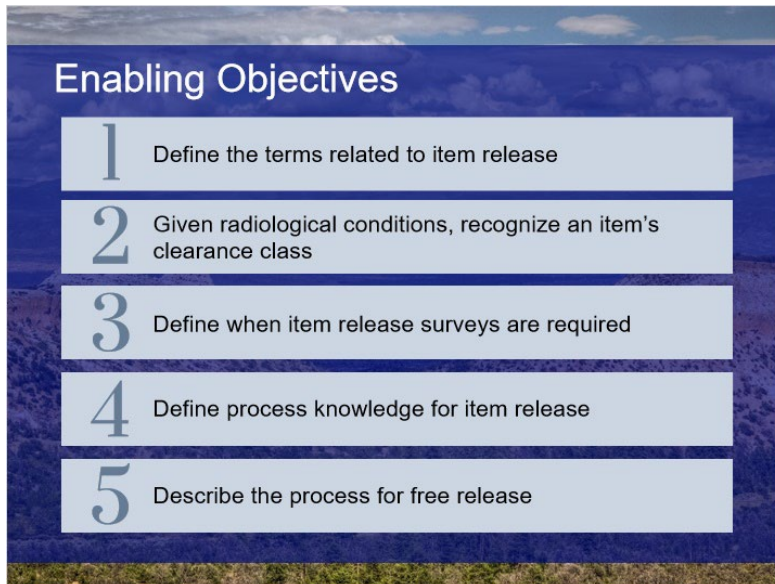


Notes:

1.3 Terminal Objective



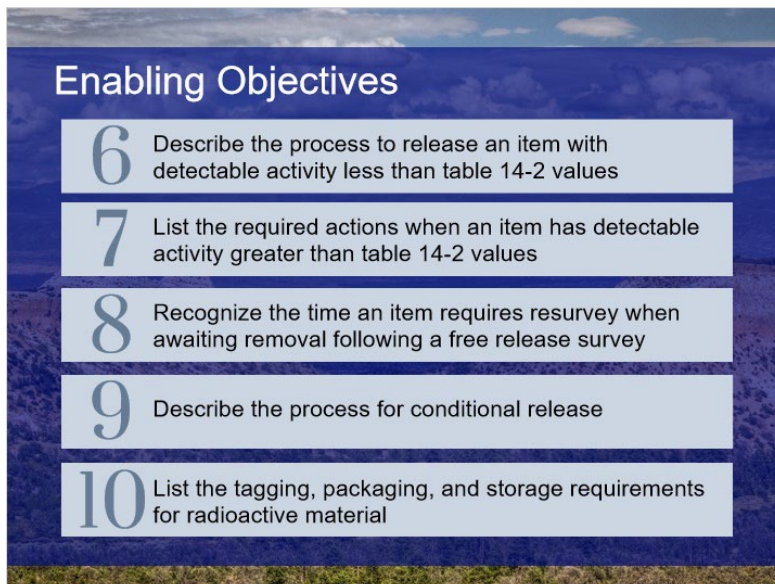
1.4 Enabling Objectives



Enabling Objectives

- 1 Define the terms related to item release
- 2 Given radiological conditions, recognize an item's clearance class
- 3 Define when item release surveys are required
- 4 Define process knowledge for item release
- 5 Describe the process for free release

1.5 Enabling Objectives Continued



Enabling Objectives

- 6 Describe the process to release an item with detectable activity less than table 14-2 values
- 7 List the required actions when an item has detectable activity greater than table 14-2 values
- 8 Recognize the time an item requires resurvey when awaiting removal following a free release survey
- 9 Describe the process for conditional release
- 10 List the tagging, packaging, and storage requirements for radioactive material

1.6 Training Purpose



Training Purpose

As an RCT, you are responsible for proper clearance of items and are a resource to our customers on this matter. This training will refresh you on the requirements associated with the various kinds of item removal and required documentation to release items from radiological control.

RCTs also frequently work in areas that contain radioactive material. It is imperative that an RCT recognizes when RAM is tagged, packaged, or stored improperly and report their findings to their supervisors to prevent the release of contamination.

Notes:

1.7 Lujan Center 1

Industry Event - 2012

**Los Alamos National Laboratory
Lujan Center, TA-53**

1.8 Lujan Center 2

Industry Event – Lujan Center Event

- The process in place in this facility included a RCT to survey and release OR control the material after irradiation, but was not understood to be required at the time.
- Typically, opening of containers with dispersible material was to be done inside of a glove-box with RCT coverage.
- After being in storage for some time, this container was disassembled for reuse by one of the workers on a bench-top without RCT coverage, which initiated the inevitable chain of events that followed.



Figure 1: Lutetium-Technetate sample container

1.9 Lujan Center 3

Industry Event – Lujan Center Continued 1

- Contamination spread to various facilities at LANL.
- 25 individuals were found to have contaminated personal items.
- 5 individuals were found to have skin contamination.
- RAP team was deployed to survey areas ranging across CO, AZ, and NM.
- At least 9 homes in NM were found to have Tc-99 contamination.
- All individuals were determined to receive less than one mrem total dose.

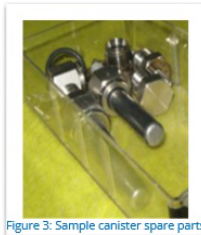


Figure 3: Sample canister spare parts



Figure 2: Sample canister similar to the one used for Lu-Tc

1.10 Lujan Center 4

Industry Event – Lujan Center Event

- The federal investigation concluded with twenty-nine total contributing factors to this event. We can take a look at these to understand and compare to the processes we have in place today.

- A few major contributors were:

- Inadequate storing and labeling of material.
- Informal and inconsistent established work controls.
- Culture where deviation from procedures normalized.



[Click on the picture to learn more about this event](#)

Notes:

1.11 LANL Event 1

LANL Event - 2020

1.12 LANL Event 2

LANL Event – Contaminated Detectors Released

- Detector one was found to have 600 dpm/smear.
- Detector two was found to have 1,000 dpm/smear.
- Instruments tagged out of service are marked surveyed below 14-2 limits.



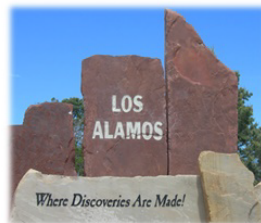
1.13 LANL Event 3

LANL Event – Contaminated Detectors Released

Luckily, no personnel or uncontrolled areas were found to be contaminated during this event. Corrective actions were implemented to prevent future issues.

Factors that could lead to an event like this:

- Improper survey technique
- Violating procedure
- Inadequate training
- Complacency



[Click on the picture to learn more about this event](#)

Notes:

1.14 How Future Events Are Minimized

How Do We Minimize Future Events Like This?

- Is the process we have in place right now sufficient to prevent release of radioactive material?
- Properly labeling and storing will prevent mishandling of material that should be controlled. Workers in the Lujan Center now have a streamlined process to control and maintain accountability for all potentially radioactive material.
- Consistently adhering to item release standards will give multiple layers of protection against an unintended release.
- How we apply process knowledge and thoroughness of surveys are vital to prevent any potential for radioactive material to reach the public. This last line of defense falls on RCTs as they evaluate each item in this process. In this presentation we will review the basic elements that go into item removal.

Notes:

1.15 Item Removal Terms

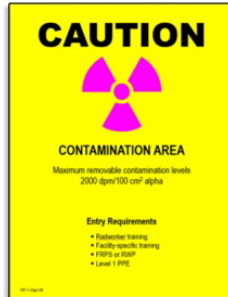
Item Removal

1.16 Release Definition

Item Removal - Release

Definition: Applies to item removal from a:

- Contamination Area (CA)
- High Contamination Area (HCA)
- Airborne Radioactivity Area (ARA)
- Radiological Buffer Area (RBA)
- Radiological Controlled Area (RCA)



Notes:

EO1: Describe the terms related to item removal

1.17 Free-Release Definition

Item Removal – Free-Release or Clearance

- Applies to any unrestricted release of items to the public from an RBA or RCA.
- Must also meet "release" requirements.
- The terms "free-release" and "clearance" are equivalent.
- LANSCE metals clearance is a special category of clearance, covered by a documented technical basis and procedure RP-SOP-077, *LANSCE Unrestricted Release of Metals Survey Process*.



Notes:

EO1: Describe the terms related to item removal

1.18 Conditional Release Definition

Item Removal – Conditional Release

- Applies to movement on-site from one radiological area for immediate placement into another radiological area.



Notes:

EO1: Describe the terms related to item removal

1.19 Knowledge Check 1

(Matching Drag-and-Drop, 10 points, unlimited attempts permitted)

Knowledge Check 1

Release

Applies to item removal from CAs, HCAs, ARAs, RBAs, and RCAs

Free-Release or Clearance

Unrestricted release of an item from a RBA or RCA

Conditional Release

Movement of an item from one radiological area immediately into another

Click the check in the lower right to submit your answer

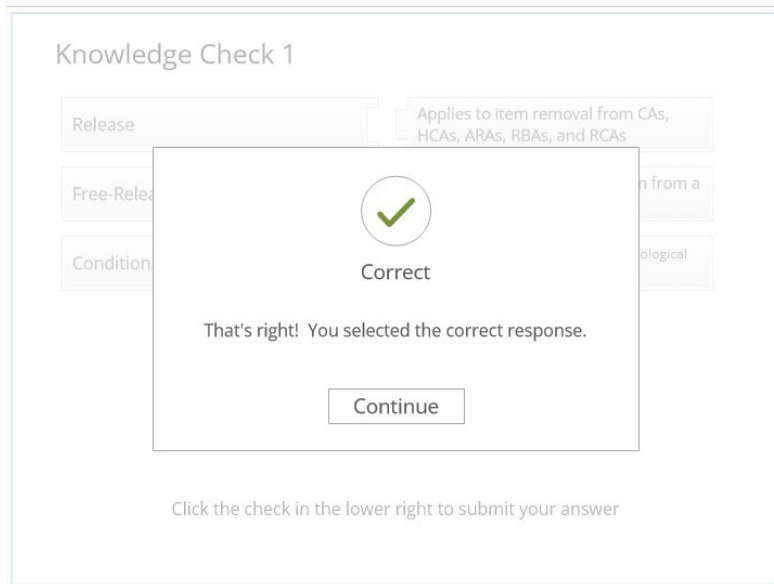
| Correct | Choice |
|---------------------------|---|
| Release | Applies to item removal from CAs, HCAs, ARAs, RBAs, and RCAs |
| Free-Release or Clearance | Unrestricted release of an item from a RBA or RCA |
| Conditional Release | Movement of an item from one radiological area immediately into another |

Feedback when correct:

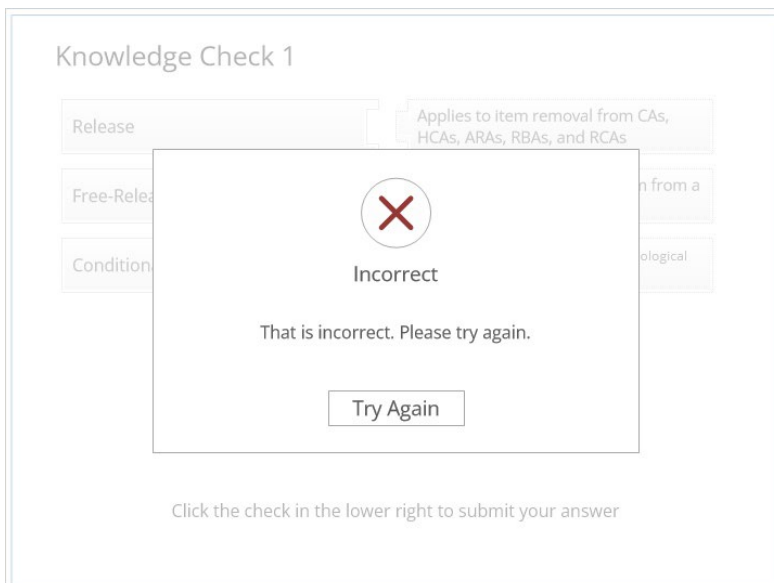
That's right! You selected the correct response.

Notes:

Correct (Slide Layer)



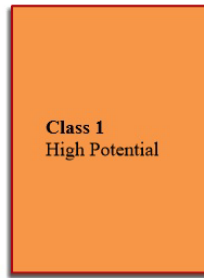
Try Again (Slide Layer)



1.20 Item Clearance Classes

Item Clearance

- Item clearance requirements depend on the location of the item, including government vehicles operated in these areas. RP-PROG-TP-200, Section 1435, Table 11 establishes item clearance classes for free-release based on location.



Notes:

EO2: Given radiological conditions determine the item clearance class

1.21 Class 1

Item Clearance – Class 1

- High potential; may be above limits—applicable areas:
 - Radiological Controlled Areas (RCAs) for contamination (including CAs, HCAs, ARAs, and RBA-Cs)
 - RCAs for Depleted Uranium (DU) shrapnel
 - RCAs for volume contamination
 - Solid Waste Management Units (SWMUs)
 - Areas of Concern (AOCs) (could also be Class 2 area)



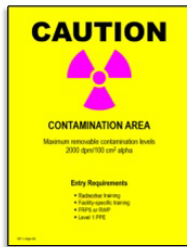
Notes:

EO2: Given radiological conditions determine the item clearance class

1.22 Class 1 Surveys

Item Clearance Surveys – Class 1

- In accordance with RP-PROG-TP-200, Section 1435.6.2a, Items leaving these areas must be surveyed for contamination unless they meet the following specific requirements to be released on process knowledge alone.



Notes:

EO3: Identify when item removal surveys are required

1.23 Class 1 Surveys Continued

Item Clearance Surveys – Class 1

- Hand-carried personal items (e.g., notebooks, pagers, and flashlights) only if ALL of the following conditions are true:
 - Items have not come into contact with any potentially contaminated surfaces.
 - Items have not entered a CA, HCA, or ARA.
 - Items have not left the direct possession of the individual.
 - The individual is free from contamination as determined by a properly conducted frisk.



Notes:

EO3: Identify when item removal surveys are required

1.24 Class 2

Item Clearance – Class 2

- Some potential; but likely below limits—applicable area:
 - RCAs for legacy contamination



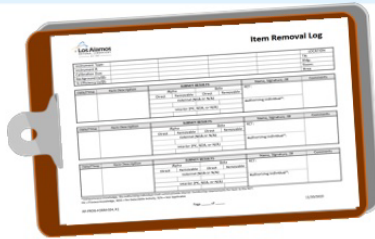
Notes:

EO2: Given radiological conditions determine the item clearance class

1.25 Class 2 Surveys

Item Clearance Surveys – Class 2

- The individual requesting item release must determine whether the item is affected by legacy contamination.
- IF the requestor determines the item is not affected by legacy contamination, THEN the item may be released without survey based on process knowledge, AND no documentation is required.
- IF the item is affected by legacy contamination, THEN the item must be evaluated and surveyed.



Notes:

EO3: Identify when item removal surveys are required

1.26 Class 3

Item Clearance – Class 3

- No contamination expected, but possible—applicable areas:
 - RCAs for external radiation
 - RCAs for radioactive material
 - Uncontrolled areas



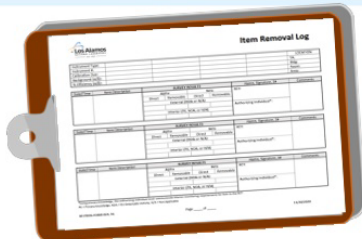
Notes:

EO2: Given radiological conditions determine the item clearance class

1.27 Class 3 Surveys

Item Clearance Surveys – Class 3

- The individual requesting item release must determine whether there are any obvious indications of radiological use history for the item (e.g., tags, labels, known radiological use).
- IF there is no obvious indication of radiological use history, THEN the item may be released without survey based on process knowledge, AND no documentation is required.
- IF there is obvious indication of radiological use history, THEN the item must be evaluated and surveyed.



Notes:

EO3: Identify when item removal surveys are required

1.28 Knowledge Check 2

(Matching Drag-and-Drop, 10 points, unlimited attempts permitted)

Knowledge Check 2

Class 1 Area

Class 2 Area

Class 3 Area

Areas with high potential for contamination like RCAs for contamination or airborne radioactivity

Areas with some potential for contamination above background but below P121 table 14-2 limits like RCAs for legacy contamination

Areas very unlikely to have contamination levels above background like RCAs for external radiation only

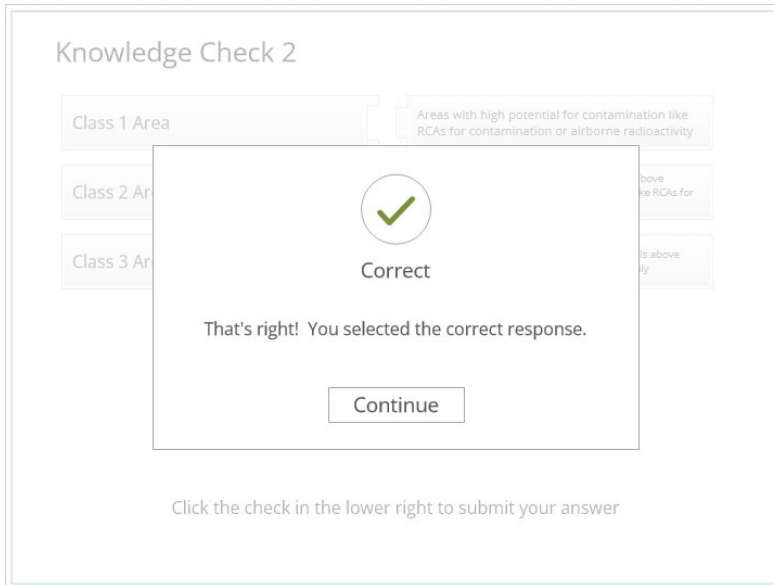
Click the check in the lower right to submit your answer

| Correct | Choice |
|--------------|--|
| Class 1 Area | Areas with high potential for contamination like RCAs for contamination or airborne radioactivity |
| Class 2 Area | Areas with some potential for contamination above background but below P121 table 14-2 limits like RCAs for legacy contamination |
| Class 3 Area | Areas very unlikely to have contamination levels above background like RCAs for external radiation only |

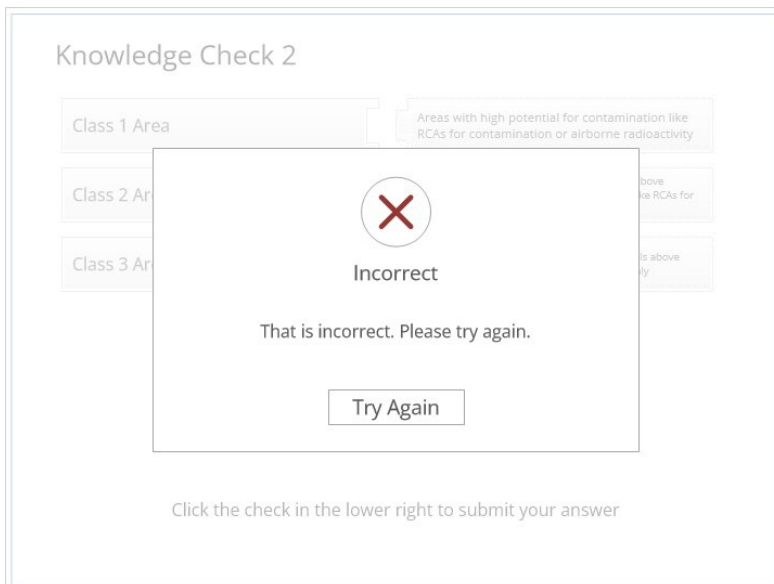
Feedback when correct:

That's right! You selected the correct response.

Correct (Slide Layer)



Try Again (Slide Layer)



1.29 Knowledge Check 3

(Multiple Choice, 10 points, unlimited attempts permitted)

An item is requested to be removed from a Class 2 area. How is it determined if surveys are required?

- ☒ The requestor determines if the item is affected by legacy contamination, which determines if a survey is required or not
- ☐ All items leaving Class 2 areas require survey before release
- ☐ No items leaving a Class 2 area require survey

Click the check in the lower right to submit your answer

| Correct | Choice |
|---------|---|
| X | The requestor determines if the item is affected by legacy contamination, which determines if a survey is required or not |
| | All items leaving Class 2 areas require survey before release |
| | No items leaving a Class 2 area require survey |


Feedback when correct:

That's right! You selected the correct response.

Correct (Slide Layer)

An item is requested to be removed from a Class 2 area. How is it determined if surveys are required?

☒ The request is made by a user with the appropriate permission,
☐ All items in the area are required.
☐ No items are required.



Correct

That's right! You selected the correct response.


Continue

Click the check in the lower right to submit your answer

Try Again (Slide Layer)

An item is requested to be removed from a Class 2 area. How is it determined if surveys are required?

☒ The request is made by a user with the appropriate permission,
☐ All items in the area are required.
☐ No items are required.



Incorrect

That is incorrect. Please try again.

Try Again

Click the check in the lower right to submit your answer

1.30 Knowledge Check 4

(Multiple Choice, 10 points, unlimited attempts permitted)

An item is requested to be released from a Class 1 area. When are surveys required to release an item from a Class 1 area?

- ☒ All items leaving a Class 1 area must be surveyed unless they meet specific requirements to be released on process knowledge
- ☐ The requestor determines whether a survey is necessary for release
- ☐ Surveys are only necessary if there is visible indication of contaminated use such as labels, tags, etc.

Click the check in the lower right to submit your answer

| Correct | Choice |
|---------|--|
| X | All items leaving a Class 1 area must be surveyed unless they meet specific requirements to be released on process knowledge |
| | The requestor determines whether a survey is necessary for release |
| | Surveys are only necessary if there is visible indication of contaminated use such as labels, tags, etc. |


Feedback when correct:

That's right! You selected the correct response.

Correct (Slide Layer)

An item is requested to be released from a Class 1 area. When are surveys required to release an item from a Class 1 area?

☒ All items require specific use
☐ The request must be approved by the Class 1 area manager
☐ Surveys are required for all items, regardless of the use



Correct

That's right! You selected the correct response.


Continue

Click the check in the lower right to submit your answer

Try Again (Slide Layer)

An item is requested to be released from a Class 1 area. When are surveys required to release an item from a Class 1 area?

☒ All items require specific use
☐ The request must be approved by the Class 1 area manager
☐ Surveys are required for all items, regardless of the use



Incorrect

That is incorrect. Please try again.

Try Again

Click the check in the lower right to submit your answer

1.31 Process Knowledge

Process Knowledge

- IF the requestor uses process knowledge for item clearance, then you must consider operational records and operating history, including the use of any radioactive materials or radiation generating devices.
- IF process knowledge is used as the sole basis for item clearance, THEN process knowledge must determine the following:
 - Whether the item was ever used for activities or in areas that could have caused internal or external contamination.
 - Whether previously contaminated items were decontaminated, met release limits, and were protected from re-contamination.
- IF process knowledge cannot demonstrate that the items are NOT contaminated, THEN surveys must be conducted.

Notes:

EO4: Describe the use of process knowledge for item release


1.32 Item Release Review

Item Clearance

- Let's take a minute to review the major steps that make up the item removal process from the perspective of an RCT.



1.33 RP-PROG-FORM-024



Item Removal Log

| | | | | | |
|---------------------|--|--|--|--|----------|
| Instrument Type: | | | | | LOCATION |
| Instrument #: | | | | | TA: |
| Calibration Due: | | | | | Bldg: |
| Background (a/B): | | | | | Room: |
| % Efficiency (a/B): | | | | | Area: |

| Date/Time | Item Description | SURVEY RESULTS | | | | Name, Signature, Z# | Comments |
|-----------|------------------|----------------------------|-----------|--------|-----------|--------------------------|----------|
| | | Alpha | | Beta | | | |
| | | Direct | Removable | Direct | Removable | RCT: | |
| | | External (NDA or N/A) | | | | Authorizing Individual*: | |
| | | | | | | | |
| | | Interior (PK, NDA, or N/A) | | | | | |
| | | | | | | | |

| Date/Time | Item Description | SURVEY RESULTS | | | | Name, Signature, Z# | Comments |
|-----------|------------------|----------------------------|-----------|--------|-----------|--------------------------|----------|
| | | Alpha | | Beta | | | |
| | | Direct | Removable | Direct | Removable | RCT: | |
| | | External (NDA or N/A) | | | | Authorizing Individual*: | |
| | | | | | | | |
| | | Interior (PK, NDA, or N/A) | | | | | |
| | | | | | | | |

| Date/Time | Item Description | SURVEY RESULTS | | | | Name, Signature, Z# | Comments |
|-----------|------------------|----------------------------|-----------|--------|-----------|--------------------------|----------|
| | | Alpha | | Beta | | | |
| | | Direct | Removable | Direct | Removable | RCT: | |
| | | External (NDA or N/A) | | | | Authorizing Individual*: | |
| | | | | | | | |
| | | Interior (PK, NDA, or N/A) | | | | | |
| | | | | | | | |

*Using process knowledge, the authorizing individual must communicate interior monitoring requirements for item to the RCT.
 PK = Process Knowledge, NDA = No Detectable Activity, N/A = Not Applicable

RP-PROG-FORM-024, R1
Page ____ of ____
11/20/2020

1.34 Item Release Video

Item Removal Demonstration

Let's observe the required actions for an RCT during this item release demonstration. An RCT has been requested to survey several tools for detectable and maintain this concentration below or above the limits of P121, Table 14-2 of concern here is uranium.

Notes:

EO5: Explain the process for free release when given an item release scenario

1.35 Item Release with Detectable Activity

Item release Below Table 14-2

RP-PROG-TP-200, Section 1435 states that, If any item with detectable activity is to be released, then a deployed RP lead and the requestor must concur on both of the following:

- Release limits have been met.
- Reasonable measures to decontaminate the items have been applied.

[Click here to see the current list of Deployed RP Leads](#)



Notes:

EO6: Review the process to release an item with detectable activity less than table 14-2 values

1.36 Items Above 14-2 Limits

Items Above Table 14-2 Limits

Items with contamination levels above P121 table 14-2 limits cannot be released unless the item is decontaminated and proven to be below table 14-2 limits by survey.



Notes:

- EO7: List the information to include on an HPRMS tag when detectable activity is greater than table 14-2 values

1.37 Removing Items After Survey

Removing Items After Survey

IF not released promptly after surveys, THEN the Deployed RP Lead (DRPL) must be consulted to ensure that appropriate controls are implemented.



Notes:

- EO9: Indicate the time an item requires resurvey when awaiting removal following a free release survey

1.38 Conditional Release

Conditional Release

- We know that if an item cannot be decontaminated below the limits of P121, Table 14-2, that it cannot be free-released. Some items may still have a useful purpose and should not be disposed of as radioactive waste. A conditional release allows you to move items like this between Radiological Controlled Areas, given that the proper monitoring and controls are exercised.



Notes:

EO10: Explain the process for conditional release when given a conditional release scenario

1.39 Knowledge Check 5

(Multiple Choice, 10 points, unlimited attempts permitted)

A worker has requested that you free-release a tool used in an RCA to control contamination. The tool has detectable contamination that is below P121 table 14-2 values. How should you proceed?

- ☐ Assume any contamination is radon or just a part of background and allow the worker to take the tool
- ☐ Control the tool as radioactive material and attach an HPRMS tag to the item
- ☒ Ensure the Deployed RP Lead and worker agree that release limits are met and reasonable measures to decon the tool have been applied before free-release
- ☐ Wipe the tool down with maslin, then free-release the tool

Click the check in the lower right to submit your answer

| Correct | Choice |
|---------|--|
| | Assume any contamination is radon or just a part of background and allow the worker to take the tool |
| | Control the tool as radioactive material and attach an HPRMS tag to the item |
| X | Ensure the Deployed RP Lead and worker agree that release limits are met and reasonable measures to decon the tool have been applied before free-release |
| | Wipe the tool down with maslin, then free-release the tool |

Feedback when correct:

That's right! You selected the correct response.

Correct (Slide Layer)

A worker has requested that you free-release a tool used in an RCA to control contamination. The tool has detectable contamination that is below P121 table 14-2 values

☐ Assume any contamination is radon or just a part of background and allow the worker to take the tool
☐ Control the tool as radioactive material and attach an HPRMS tag to the item
☒ Ensure the Deployed RP Lead and worker agree that release limits are met and reasonable measures to decon the tool have been applied before free-release
☐ Wipe the tool down with maslin, then free-release the tool

Correct

That's right! You selected the correct response.

Continue

Click the check in the lower right to submit your answer

Try Again (Slide Layer)

A worker has requested that you free-release a tool used in an RCA to control contamination. The tool has detectable contamination that is below P121 table 14-2 values

☐ Assume worker is free to use the tool and allow the worker to leave the area

☐ Control the tool as radioactive material and attach an HPRMS tag since the item was used in an area controlled for contamination

☒ Ensure the tool is free of contamination and release the tool

☐ Wipe the tool with a wet paper towel and release the tool

Incorrect

That is incorrect. Please try again.

[Try Again](#)

Click the check in the lower right to submit your answer

1.40 Knowledge Check 6

(Multiple Choice, 10 points, unlimited attempts permitted)

Another tool is requested for free-release from an RCA for contamination. This tool has been smeared and direct surveyed to be found with no detectable contamination, and has no potential for internal contamination. How do you proceed?

☐ Hand the tool to the requestor with no further action

☒ Document survey results in RP-PROG-FORM-024, have the worker sign the form, and release the tool

☐ Control the tool as radioactive material and attach an HPRMS tag since the tool was used in an area controlled for contamination

☐ Request Deployed RP Lead for concurrence to release the tool

Click the check in the lower right to submit your answer

| Correct | Choice |
|---------|---|
| | Hand the tool to the requestor with no further action |

| | |
|---|--|
| X | Document survey results in RP-PROG-FORM-024, have the worker sign the form, and release the tool |
| | Control the tool as radioactive material and attach an HPRMS tag since the tool was used in an area controlled for contamination |
| | Request Deployed RP Lead for concurrence to release the tool |

Feedback when correct:


That's right! You selected the correct response.

Correct (Slide Layer)

Another tool is requested for free-release from an RCA for contamination. This tool has been smeared and direct surveyed to be found with no detectable contamination.

☐ Hand the tool over to the worker for use in the area.
 ☒ Document survey results in RP-PROG-FORM-024, have the worker sign the form, and release the tool.
 ☐ Control the tool as radioactive material and attach an HPRMS tag since the tool was used in an area controlled for contamination.
 ☐ Request Deployed RP Lead for concurrence to release the tool.

Click the check in the lower right to submit your answer



Correct

That's right! You selected the correct response.

Continue

Try Again (Slide Layer)

Another tool is requested for free-release from an RCA for contamination. This tool has been smeared and direct surveyed to be found with no detectable contamination.


☐ Hand the tool to the worker for decontamination.

☒ Document the tool, and then release the tool to the worker for decontamination.

☐ Control the tool was found with no detectable contamination.

☐ Request Deployed RP Lead for concurrence to release the tool.

Click the check in the lower right to submit your answer



Incorrect

That is incorrect. Please try again.

Try Again

1.41 Knowledge Check 7

(Multiple Choice, 10 points, unlimited attempts permitted)

A worker requests a contaminated calibration tool to be moved from one controlled area to another in the same building. Other than decontaminating, what other option is available to you?

☐ Move the tool very quickly to the other controlled area to minimize the chances any contamination falls off

☒ Use Conditional Release to package the tool, survey the package exterior to ensure no contamination is present, and escort the worker with the package to the new controlled area

☐ Traverse with the item through the basement or maintenance hallways, if possible, so any contamination that falls off will not deposit in a high traffic area

☐ If the other controlled area is close enough, toss the tool to a person who can receive it

Click the check in the lower right to submit your answer

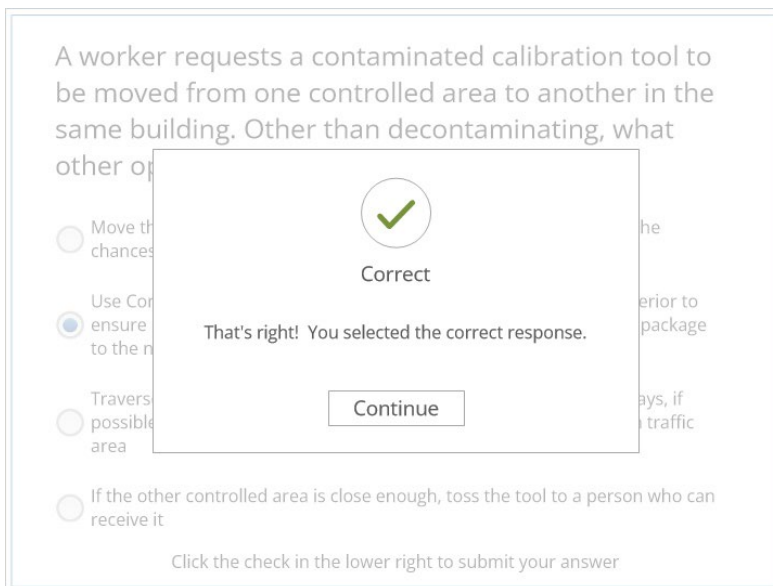
| Correct | Choice |
|---------|---|
| | Move the tool very quickly to the other controlled area to minimize the chances |

| | |
|---|---|
| | any contamination falls off |
| X | Use Conditional Release to package the tool, survey the package exterior to ensure no contamination is present, and escort the worker with the package to the new controlled area |
| | Traverse with the item through the basement or maintenance hallways, if possible, so any contamination that falls off will not deposit in a high traffic area |
| | If the other controlled area is close enough, toss the tool to a person who can receive it |

Feedback when correct:

That's right! You selected the correct response.

Correct (Slide Layer)



Try Again (Slide Layer)

A worker requests a contaminated calibration tool to be moved from one controlled area to another in the same building. Other than decontaminating, what other options are available?


☐ Move the tool to a different controlled area, if possible.

☒ Use Contamination Control Procedures to ensure the tool is properly decontaminated prior to package transport.

☐ Traverse the tool through the controlled area, if possible, to avoid traffic.

☐ If the other controlled area is close enough, toss the tool to a person who can receive it.

Click the check in the lower right to submit your answer



Incorrect

That is incorrect. Please try again.


[Try Again](#)

1.42 HPRMS Tags

HPRMS Tags

Information to include on a HPRMS tag:

| | |
|---|--|
| <ul style="list-style-type: none">• Instrument manufacturer• Instrument model• Instrument number• Calibration due date• HPAL barcode number(s) if applicable• Location• Description• Primary radionuclides | <ul style="list-style-type: none">• Check applicable contamination category• Circle "Material" or "Inner Container"• Survey results• Comments or specific controls• Print name, sign, AND date form• HPFC review and signature if leaving LANL property |
|---|--|



Notes:

- EO7: List the information to include on an HPRMS tag when detectable activity is greater than table 14-2 values

1.43 Filling out an HPRMS Tag

HPRMS Tags

Instrument manufacturer

Instrument model

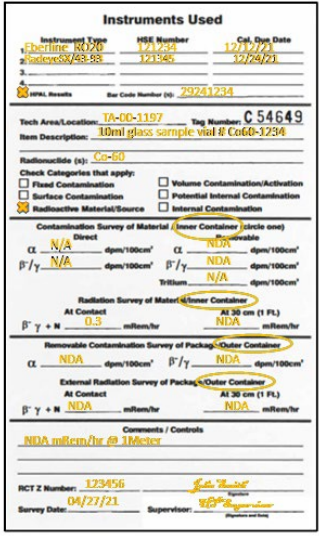
HEALTH, SAFETY AND ENVIRONMENTAL CONTROLS

Survey results time for contamination category

Circle "Material" or "Inner Container"

Enter NDA if no detectable activity is found for the applicable field

Calibration due date



The HPRMS Tag form is a detailed record for radiation safety. It includes sections for 'Instruments Used' (listing Eberline RO-20 and Radeye SR-93), 'Tech Area/Location' (TA-00-1197), and 'Item Description' (10ml glass sample vial # C060-1234). The form contains various survey results for contamination, including 'Contamination Survey of Material' and 'Radiation Survey of Material'. It also has checkboxes for 'Check Categories that apply' (Fixed Contamination, Surface Contamination, Radioactive Material/Source) and 'Volume Contamination/Activation', 'Potential Internal Contamination', and 'Internal Contamination'. The form is signed by a supervisor and dated 04/27/21.

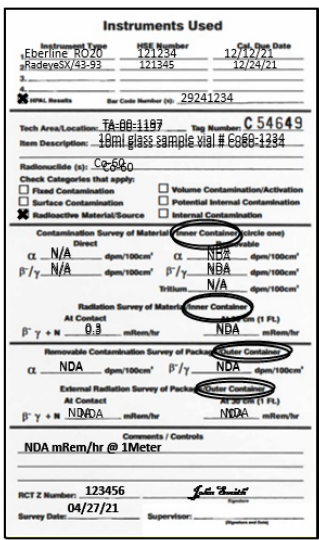
Notes:

EO7: List the information to include on a HPRMS tag when detectable activity is greater than table 14-2 values.

1.44 Filling out an HPRMS Tag Continued

HPRMS Tags

- Remove original copy by tearing at perforated line.
- Maintain original as a survey record
- Attach yellow cardstock tag to item.
- Provide customer with a copy if requested



The HPRMS Tag form is a detailed record for radiation safety. It includes sections for 'Instruments Used' (listing Eberline RO-20 and Radeye SR-93), 'Tech Area/Location' (TA-00-1197), and 'Item Description' (10ml glass sample vial # C060-1234). The form contains various survey results for contamination, including 'Contamination Survey of Material' and 'Radiation Survey of Material'. It also has checkboxes for 'Check Categories that apply' (Fixed Contamination, Surface Contamination, Radioactive Material/Source) and 'Volume Contamination/Activation', 'Potential Internal Contamination', and 'Internal Contamination'. The form is signed by a supervisor and dated 04/27/21.

1.45 Packing and Storing RAM

Packaging and Storing Radioactive Material

P121 *Radiation Protection, Section 1722.3:*

- Radioactive material must be packaged and stored so that the package integrity is maintained to prevent the release of contamination; higher risk materials require more robust packaging.



Notes:

EO8: Locate the requirements for packaging and storing radioactive material

1.46 Packaging and Storing RAM Continued

Packaging and Storing Radioactive Material Continued

Factors to consider:

- Source term
- Area designation
- The storage area
- Package integrity
- Sharp edges
- Potential for individuals to be exposed to compromised storage packaging
- ALARA measures



1.47 Knowledge Check 8

(Multiple Choice, 10 points, unlimited attempts permitted)

You are preparing a HPRMS tag for a shipment of radioactive material to a nuclear facility in Washington state. What must be included on the HPRMS tag?

- ☐ A 5 meter radiation reading for beta gamma and neutron in the comments
- ☒ An HPFC signature on the supervisor line
- ☐ Nothing special needs to be added to the tag
- ☐ A second RCT signature in the comment section for validation

Click the check in the lower right to submit your answer


| Correct | Choice |
|---------|--|
| | A 5 meter radiation reading for beta gamma and neutron in the comments |
| X | An HPFC signature on the supervisor line |
| | Nothing special needs to be added to the tag |
| | A second RCT signature in the comment section for validation |

Feedback when correct:

That's right! You selected the correct response.

Correct (Slide Layer)

You are preparing a HPRMS tag for a shipment of radioactive material to a nuclear facility in Washington state. What must be included on the HPRMS tag?



Correct

That's right! You selected the correct response.

Continue

☐ A 5 meter distance

☒ An HPF


☐ Nothing

☐ A second

Click the check in the lower right to submit your answer

Try Again (Slide Layer)

You are preparing a HPRMS tag for a shipment of radioactive material to a nuclear facility in Washington state. What must be included on the HPRMS tag?



Incorrect

That is incorrect. Please try again.

Try Again

☐ A 5 meter distance

☒ An HPF

☐ Nothing

☐ A second

Click the check in the lower right to submit your answer

1.48 Knowledge Check 9

(Multiple Choice, 10 points, unlimited attempts permitted)

You're providing oversight for personnel working in a fume hood and they break an empty bottle in the work area. They start placing broken shards of glass into a plastic bag. What should you tell the workers?

- ☐ Don't say anything. The glass won't damage the bag as long as the bag is handled carefully.
- ☒ Tell the workers to place the broken glass in more robust container first so the glass cannot cut open the packaging.
- ☐ Tell the workers to push the broken glass into the corner of the fume hood and ignore it for the remainder of the job.
- ☐ Advise the workers to carefully place the broken glass in their gloved hands and walk it over to the nearest rad waste bin for disposal.

Click the check in the lower right to submit your answer

| Correct | Choice |
|---------|--|
| | Don't say anything. The glass won't damage the bag as long as the bag is handled carefully. |
| X | Tell the workers to place the broken glass in more robust container first so the glass cannot cut open the packaging. |
| | Tell the workers to push the broken glass into the corner of the fume hood and ignore it for the remainder of the job. |
| | Advise the workers to carefully place the broken glass in their gloved hands and walk it over to the nearest rad waste bin for disposal. |

Feedback when correct:

That's right! You selected the correct response.

Correct (Slide Layer)

You're providing oversight for personnel working in a fume hood and they break an empty bottle in the work area. They start placing broken shards of glass into a p


Don't sa
handled

☒ Tell the
glass ca

☐ Tell the
and ign

☐ Advise the workers to carefully place the broken glass in their gloved hands and walk it over to the nearest rad waste bin for disposal.

Click the check in the lower right to submit your answer


Correct
That's right! You selected the correct response.
Continue

Try Again (Slide Layer)

You're providing oversight for personnel working in a fume hood and they break an empty bottle in the work area. They start placing broken shards of glass into a p


Don't sa
handled

☒ Tell the
glass ca

☐ Tell the
and ign

☐ Advise the workers to carefully place the broken glass in their gloved hands and walk it over to the nearest rad waste bin for disposal.

Click the check in the lower right to submit your answer


Incorrect
That is incorrect. Please try again.
Try Again

1.49 Conclusion

Conclusion

Los Alamos National Laboratory is a uniquely important part of society on a national scale, and specifically the surrounding areas of Northern New Mexico. The release of potentially radioactive materials has a direct impact on the Laboratory's mission to protect the environment and the public. It is imperative that every RCT performing item release does so thoroughly, consistently, and documents the process accurately. The fundamental skills practiced in this activity are designed to protect you, your coworkers, the Lab, as well as everyone in our community from potential radiological hazards.



4/8/2021

1.50 End of Course

End of Course

Congratulations! You have successfully completed the online portion of the Item Removal and RAM Control Continuing Training. To receive full credit, you must also complete the associated quiz. Be sure to also sign up for the required in-person training under course number 58227 in UTrain.



Questions? Contact rp-training@lanl.gov

[EXIT COURSE](#)

RCT Continuing Training: Item Release and Ram Control Transcript

Slide 1.1 – Item Removal Training

(LANL Title Page)

Slide 1.2 – Welcome Layout

“Welcome to RCT Continuing Training. This quarter’s topic will review the fundamental elements of radioactive material (RAM) control and releasing items from controlled areas to include: evaluation if an item may be released and the actions necessary to perform a release from a controlled area. To complete this training, you will be required to view the online presentation and independently complete its associated quiz. The in-person training for this quarter can be found on UTrain course number 58227. Please register for a day that works best with your schedule.”

Slide 1.3 – Terminal Objective

“The terminal objective for this course is: Given the need to perform duties as an RCT, recognize the requirements for item release and radioactive material in accordance with RP-PROG-TP-200, Radiation Protection Manual and P-121, Radiation Protection.”

Slide 1.4 – Enabling Objectives

“The enabling objectives for this course are:

1. Define the terms related to item release
2. Given radiological conditions, recognize an item’s clearance class.
3. Define when item release surveys are required
4. Define process knowledge for item release
5. Describe the process for free release

Slide 1.5 – Enabling Objectives Continued

6. Describe the process to release an item with detectable activity less than table 14-2 values
7. List the required actions when an item has detectable activity greater than table 14-2 values
8. Recognize the time an item requires resurvey when awaiting removal following a free-release survey
9. Describe the process for conditional release and
10. List the tagging, packaging, and storage requirements for radioactive material”

Slide 1.6 – Training Purpose

“As an RCT, you are responsible for proper clearance of items and are a resource to our customers across the lab on this matter. This training will refresh you on the requirements associated with the various kinds of item removal and the required documentation to release items from radiological control. You also frequently work in areas that contain radioactive material. It is imperative that you recognize when RAM is tagged, packaged, or stored improperly and report your findings to your supervisors to prevent the release of contamination.”

Slide 1.7 – Lujan Center 1

“Before we begin this online lecture, let’s take a moment to review an industry event which occurred here at Los Alamos National Lab that demonstrates what could happen if there is a breakdown in item removal practices and radiological controls. In 2012, a scientist working at the Lujan Center inadvertently spread radioactive contamination outside of controlled areas of the facility. The Lujan Center is located at TA-53 and welcomes scientists from all over the world to conduct research there. The contamination originated from a sample container that had previously been used to hold a powder sample made up of intrinsically radioactive technetium. Days after the initial release, the first indication of a problem resulted from a Personnel Contamination Monitor that alarmed on a worker in an adjacent area. The nuclide of concern was initially unknown and Technetium ninety-nine, being difficult to detect, was underreported during early investigative surveys.”

Slide 1.8 – Lujan Center 2

“The item release process in place at TA-53 included a RCT to survey and release OR control the material after irradiation, but was not understood by the scientist to be required at the time of the event.

Typically, opening of containers with dispersible material was to be done inside of a glove-box with RCT coverage.

After being in storage for some time, this container was disassembled for reuse by one of the workers on a benchtop without RCT coverage, which initiated the inevitable chain of events that followed.”

Slide 1.9 – Lujan Center 3

“The final investigation results found contamination spread throughout various uncontrolled areas. According to the federal investigative report, a total of twenty-five people were found to have contaminated personal items, five of which had skin contamination.

The Radiological Assistance Program, or RAP Team, was deployed to survey areas of concern in Colorado, Arizona, and New Mexico. At least nine homes in New Mexico were found to have Technetium 99 contamination.

All individuals involved were determined to receive less than one milli-rem total dose.”

Slide 1.10 – Lujan Center 4

“The federal investigation concluded with twenty-nine total contributing factors to this event.

We can take a

look at these to understand and compare to the processes we have in place today.

A few of the major contributors that pertain to RP were:

- Inadequate storing and labeling of radioactive material
- Informal and inconsistent established work controls
- And, a culture where deviation from procedures was normalized.”

Slide 1.11 – LANL Event 1

“In 2020, two Ludlum model 215 detectors were sent to RIC for repair with out of service tags noting continuous chirping. RP-Services personnel investigating the cause, discovered removable contamination on the detectors at TA-36.”

Slide 1.12 – LANL Event 2

“One detector was determined to have six-hundred dpm, and the other one-thousand dpm per smear. Instrument out of service tags include a checkbox that communicate the required survey results are less than the applicable limits of P121, table 14-2. RCTs who check this box acknowledge that they have surveyed and verified each instrument to be less than the table 14-2 limits.”

Slide 1.13 – LANL Event 3

“Fortunately, no personnel or uncontrolled areas were found to be contaminated during this event. Corrective actions included additional RCT training and review of procedures associated with item release. Combining proper survey techniques with procedure use and adherence helps to prevent releasing contaminated instruments to uncontrolled areas. Personnel responsible for surveying and releasing instruments must understand the requirements and risks involved with item clearance. You may click on the picture link to learn more about this event.”

Slide 1.14 – How Future Events are Minimized

“It is important to consider the effectiveness of our RP practices in place. Ask yourself: Is the process we have in place right now sufficient to prevent release of radioactive material?

The proper labeling and storing of radioactive material will prevent mishandling of items that should be controlled. Workers in the Lujan Center now have reviewed their practices and implemented a streamlined process to control and maintain accountability for all potentially radioactive material.

Consistently adhering to item release standards will give multiple layers of protection against an unintended release.

How we apply process the item removal process is vital to preventing radioactive material from reaching the public. The last line of defense falls on RCTs as they evaluate each item in this process. In this presentation we will review the basic elements that go into item removal.”

Slide 1.15 – Item Removal Terms

“Let’s start by taking a look at the key terms related to item removal. You can find these definitions in RPPROG-TP-200, Section 1435.1, Table 10; Release, Free-Release or Clearance, and Conditional Release.”

Slide 1.16 – Release Definition

“According to RP-PROG-TP-200, the term “release” applies to item removal from a contamination area, high contamination area, airborne radioactivity area, radiological buffer area, or radiological controlled area. This type of removal ensures the item always remains within a radiologically controlled area.”

Slide 1.17 – Free-Release Definition

“Free-Release, or Clearance, applies to any *unrestricted release* of items to the public from a Radiological Buffer Area or Radiological Controlled area; for contamination. Items that are free released must meet release requirements and have documentation to support the release requirements have been met. The terms free-release and clearance are equivalent and can be used interchangeably. The RP Field manual does not address all types of Free-Release. One example of this is the clearance of metals from LANSCE, which requires a special process for release. Requirements for release of metals from LANSCE are covered in RP-SOP-077, *LANSCE Metals Clearance Process*.”

Slide 1.18 – Conditional Release Definition

“The term Conditional Release applies to movement on-site from one radiological area for immediate placement into another radiological area.”

Slide 1.19 – Knowledge Check 1

Slide 1.20 – Item Clearance Classes

“Item clearance requirements depend on the location in which the item is used. Government vehicles are held to the same clearance requirements as the areas in which they are used. RP-PROG-TP-200, Section 1435.5, Table 11 establishes item clearance classes for free-release based on location.”

Slide 1.21 – Class 1

“Class 1 is a designation for areas with a high potential for contamination. The areas that fall under this category are Radiological Controlled Areas for contamination that include Contamination Areas, High Contamination Areas, Airborne Radioactivity Areas and Radiological Buffer Areas for contamination. Also, RCA’s for DU or Volume Contamination, Solid waste Management Units, and any other areas of concern.”

Slide 1.22 – Class 1 Surveys

“In accordance with RP-PROG-TP-200, Section 1435.6.2a, Items leaving a class one clearance area must be surveyed for contamination unless they meet the following specific requirements for being released without survey, based on process knowledge alone.”

Slide 1.23 – Class 1 Surveys Continued

“Hand-carried personal items such as notebooks, pagers, and flashlights, only if all of the following conditions are true:

- Items have not come into contact with any potentially contaminated surfaces.
- Items have not entered a CA, HCA, or ARA.
- Items have not left the direct possession of the individual.
- The individual is free from contamination as determined by a properly conducted frisk.”

Slide 1.24 – Class 2

“Class 2 areas have some potential for contamination, but likely below the limits of P121, Table 14-2. These areas are posted as Radiological Controlled Areas for Legacy Contamination.”

Slide 1.25 – Class 2 Surveys

“The individual requesting item release must determine whether the item is affected by legacy contamination.

If the requestor determines the item is not affected by legacy contamination, then the item may be released without survey based on process knowledge.

If the item is affected by legacy contamination, then the item must be evaluated and surveyed.

Note that the burden to initiate this process often lies with the workers in these areas. Which increases the importance of a clear and open line of communication between RP and our customers. RCTs who are regularly involved and who interact with the workers on a regular basis can be more effective at ensuring that these requirements are met.”

Slide 1.26 – Class 3

“No contamination is expected in Class 3 clearance areas, but it is possible. These are posted as Radiological Controlled Area’s posted for external radiation hazards or for radioactive material storage.”

Slide 1.27 – Class 3 Surveys

“Like class 2, in a class 3 area, the individual requesting item release must determine whether there are any obvious indications of radiological use history for the item.

If there is no obvious indication of radiological use history, then the item may be released without survey based on process knowledge, and no documentation is required.

If there is obvious indication of radiological use history, then the item must be evaluated and surveyed.”

Slide 1.28 – Knowledge Check 2

Slide 1.29 – Knowledge Check 3

Slide 1.30 – Knowledge Check 4

Slide 1.31 – Process Knowledge

“If the requestor uses process knowledge for item clearance, then you must consider operational records and operating history, including the use of any radioactive materials or radiation generating devices. If process knowledge is used as the sole basis for item clearance, then you must determine the following:

- Whether the item was ever used for activities or in areas that could have caused internal or external contamination.

- And, whether previously contaminated items were decontaminated, met release limits, and were protected from re-contamination.

If process knowledge cannot demonstrate that the items are not contaminated, then surveys must be conducted.”

Slide 1.32 – Item Release Review

“Let’s take a minute to review the major steps that makeup the item removal process from the perspective of an RCT.

- Item removal is requested, based on the requestor’s determination that there is potential for radioactive contamination.
- RCT evaluates item to be removed. Identify area clearance class, consider process knowledge, and determine eligibility for release.
- RCT performs all necessary surveys to include a direct frisk of all accessible external surfaces, and a sufficient amount of removable contamination surveys.
- RCT documents surveys. If the item is to be released, this requires and RP-PROG-FORM-024. If the item is found to include radioactive material, an HPRMS tag should be attached. Some situations may warrant additional documentation with the RP-PROG-FORM-114.”

Slide 1.33 – RP-PROG-FORM-024

“RP-PROG-TP-200, Section 1435.1, states that if an item meets release limits, item removal must be documented using RP-PROG-FORM-024.”

Slide 1.34 – Item Release Video

All audio is included in pre-recorded video.

Slide 1.35 – Item Release with Detectable Activity

“RP-PROG-TP-200, Section 1435 states that, if any item with detectable activity is to be released, then a deployed RP lead and the requestor must concur on both of the following:

- Release limits have been met
- And, reasonable measures to decontaminate the items have been applied.

Click the link to see the current list of Deployed RP Leads.”

Slide 1.36 – Items Above 14-2 Limits

“Items with contamination levels above P121 table 14-2 limits cannot be released unless the item is decontaminated and proven to be below table 14-2 limits by survey.”

Slide 1.37 – Removing Items After Survey

“Items should be removed from the area immediately or staged for removal in a way that would not risk contamination and invalidate recent surveys. RP-PROG-TP-200 states that if not removed promptly after surveys, then the deployed RP Lead must be consulted to ensure that appropriate controls are implemented to prevent potential contamination of the surveyed item.”

Slide 1.38 – Conditional Release

“Items that cannot be decontaminated below the limits of P121, Table 14-2, cannot be free-released. Some items may still have a useful purpose and should not be disposed of as radioactive waste. A conditional release allows you to move items like this between radiological Controlled Areas, given that the proper monitoring and controls are exercised.”

Slide 1.39 – Knowledge Check 5

Slide 1.40 – Knowledge Check 6

Slide 1.41 – Knowledge Check 7

Slide 1.42 – HPRMS Tags

“If an item is found to have contamination, it should be labeled with a Health Physics Radioactive Material Survey tag. Let’s take a minute to review sections to be filled out on an HPRMS tag.”

Slide 1.43 – Filling out an HPRMS Tag

Pause between each phrase.

- “Instrument manufacturer, model, number, and calibration due date.
- HPAL barcode number, if applicable.
- Location.
- Item description.
- Primary Nuclides.
- Check all applicable contamination categories.
- Circle either material or inner container based on the contamination surveys taken.
- Record survey results for direct and removable contamination surveys as applicable. Write ‘N’ slash ‘A’ for fields that are not applicable. Write ‘N’, ‘D’, ‘A’ for items with no detectable activity.
- Circle either material or inner container based on the radiation surveys taken.
- Record beta/gamma+neutron survey results in millirem per hour on contact and at 30cm.
- Circle either package or outer container for contamination surveys taken.
- Record removable contamination results for alpha and beta in dpm per 100 cm².
- Circle either package or outer container based on radiation surveys taken.
- Record beta/gamma+neutron survey results in millirem per hour on contact and at 30cm.
- In the comments section, add any amplifying information or specific controls that may be required. Items being tagged for shipping will record the beta/gamma plus neutron reading at one meter here.
- Record your Z#, sign and date as the responsible RCT.
- And finally, HPFC signatures are required for items that are leaving LANL Property.”

Slide 1.44 – Filling out an HPRMS Tag Continued

“Once the tag is filled out, ensure that all information was transferred and is legible on the yellow cardstock tag. Remove the perforated sheets and maintain the original copy with radiological survey records. Attach the yellow cardstock tag to the material and provide the requestor with a copy of the tag if desired. Once attached, HPRMS tags may only be removed by or under direction of RP Personnel.”

Slide 1.45 – Packing and Storing RAM

“Radioactive material must be packaged and stored so that the package integrity is maintained to prevent release of contamination; higher risk materials require more robust packaging. For example, it does not make sense to store sharp edged materials in a plastic bag as the sharp edges would easily tear open a hole on the bag. A more robust containment or some form of protection applied to the sharp objects must be used to prevent the loss of the integrity in the storage container and consequentially the release of contamination.”

Slide 1.46 – Packaging and Storing RAM Continued

“Packing and storage requirements in accordance with P121, Section 1722.3 state that the following factors must be considered by those packaging and storing radioactive material:

- Source term
- Area designation
- The storage area
- Package integrity
- Sharp edges
- Potential for individuals to be exposed
- And, ALARA measures”

Slide 1.47 – Knowledge Check 8

Slide 1.48 – Knowledge Check 9

Slide 1.49 – Conclusion

“Los Alamos National Laboratory is a uniquely important part of society on a national scale, and specifically the surrounding areas of Northern New Mexico. The release of potentially radioactive materials has a direct impact on the Laboratory’s mission to protect the environment and the public. It is imperative that every RCT performing item release does so thoroughly, consistently, and documents the process accurately. The fundamental skills practiced in this activity are designed to protect you, your coworkers, the Lab, as well as everyone in our community from potential radiological hazards.”

Slide 1.50 End of Course

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