

**NUCLEAR INDUSTRY STANDARD PROCESS**  
**Radiological Protection**

Level 3 – Information Use

**Personnel Contamination Monitoring**

**NISP-RP-006**

**Revision: 1**

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*This is an industry document for standardizing radiation protection processes. Standard processes and requirements are established to eliminate site-specific radiation protection procedures. The Institute for Nuclear Power Operations (INPO) maintains current procedures on the INPO website. Approval authority is granted by the industry contingent on a structured review and approval process by representatives of utility radiation protection organizations.*

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## **1.0 Purpose**

- 1.1. This procedure describes the process for monitoring personnel for skin and clothing contamination and proper decontamination methods.

## **2.0 Scope**

- 2.1 This procedure describes the normal process for monitoring personnel assuming contamination monitors are operational. In the event equipment is not available site specific procedures will provide guidance to supplemental personnel. Documentation of personnel contamination events will be completed using site specific forms, electronic processes, or the attachments to this procedure.
- 2.2 The forms referenced by this procedure are examples used to describe the pertinent information that should be recorded for future reference. Plant procedures may specify the use of equivalent forms or the use of electronic media for the same purposes.
- 2.3 Member utilities are expected to use this standard to enable supplemental workers to transition between nuclear power plants. Compliance with these instructions is expected without additional site requirements or process deviations being imposed that may require additional training or challenge the performance of supplemental workers.
- 2.4 This is an information use procedure that will be used to train and instruct supplemental radiological protection technicians. Member utilities may implement these process requirements in site procedures provided the site procedures are equivalent and updated whenever this Nuclear Industry Standard Process (NISP) is revised. Member utilities may also elect to delete equivalent site-specific procedures and use this procedure for training and instruction. Current revisions are maintained on the INPO website.

## **3.0 Definitions**

- 3.1 Terms, acronyms, and definitions are provided in NISP-RP-013, *Radiation Protection Standard Glossary of Terms*.

## **4.0 Responsibilities**

- 4.1 Radiation Protection is responsible for the implementation of the requirements of this procedure per Efficiency Bulletin 17-01 and the Nuclear Industry Standard Process Initiative.
- 4.2 The Radiation Protection Technician is responsible for:
  - 4.1.1 Providing contamination survey information used to determine the activity of contamination.

- 4.1.2 Supporting the decontamination efforts described by this procedure.
- 4.3 Radiation Protection Supervision is responsible for:
  - 4.3.1 Reviewing personnel contamination events and determining any follow up actions
  - 4.3.2 Contacting the Radiation Protection Manager or designee if decontamination attempts are unsuccessful
  - 4.3.3 Informing workers of the hazard associated with PCEs and answering any questions from the worker.
  - 4.3.4 Ensuring skin dose assessments are performed in accordance with site specific procedures.
- 4.4 Radiation Protection Manager (or designee) is responsible for:
  - a. Overall implementation of this procedure.
  - b. Approving conditional release of individuals who are unable to clear the whole body monitors.

## **5.0 General Requirements**

- 5.1 All personnel must exit through a beta and gamma sensitive monitor(s) prior to final exit from the RCA. Contamination monitoring may also occur inside the plant in locations where the background is suitable for monitoring.
  - 5.1.1 Radiologically Controlled Area (RCA) Exits
    - a. When exiting the main RCA directly to an outside RCA, a minimum of a hand and foot frisk is required before exiting the main RCA.
    - b. Exits into Non-RCA areas established within the RCA (i.e. Main Control Room) should have the same monitoring capabilities as the main RCA exit. If background levels preclude establishing these requirements, this should be evaluated to ensure risk of radioactive material is minimized.

NOTE: ISFSI casks, for the purpose of this procedure, are not considered radioactive material containers if determined to be free of external contamination.

5.1.2 Satellite RCA Exit (Non-Power Block)

- a. **If** entering an area where radioactive material containers are stored (RCA or RMA) **or** where contamination could be present, **then PERFORM** as a minimum hand and foot frisk when exiting and then proceed to the nearest whole-body contamination and gamma sensitive monitor for complete monitoring.
- b. **If** the area is an RCA only because of dose rates **and** there are **no** radioactive material storage containers or contamination source present in the area, contamination monitoring is **not** required (“no frisk” RCA).
- c. On a temporary basis, to facilitate movement of radioactive material storage containers, an area posted as an RCA or RMA may be temporarily designated as a “no frisk” RCA. The area may be released from the need to perform contamination monitoring upon each exit from the area provided radiation protection coverage is provided and an adequate survey of the area is periodically performed (e.g. each shift) to ensure **no** contamination is present.
- d. Monitoring should be performed in accordance with the posted instructions at each area. As a minimum, these instructions should instruct personnel to proceed to the nearest whole body monitors at the end of shift or prior to exit from the site.

5.1.3 Protected Area Exit

- a. Gamma whole body monitor(s) and field monitoring instrument(s) and monitoring instructions shall be located at the guardhouse exit from the protected area.
- b. All personnel must exit through a gamma sensitive portal monitor (PM) prior to exiting the protected area.

NOTE: EPRI Technical Report, 3002009426, Guidelines for Industry Response to Personnel Contamination, defines the levels for contamination

5.2 Personnel Contamination Events are classified using the following criteria:

- 5.2.1 Level 1 100 ccpm – 5000 ccpm
- 5.2.2 Level 2 >5000 ccpm – 50,000 ccpm

5.2.3 Level 3 >50,000 ccpm

NOTE: Based on site specific isotopes of concern the station may complete a prospective analysis and provide additional guidance for when skin dose assessments are required. Skin dose shall be assessed if there is the potential for 500 mrem or greater. The station may decide to calculate and assess skin dose at a value lower than 500 mrem.

- 5.3 Skin dose assessment will be determined by the sites prospective determination or as defined in section 6.4.5.
- 5.3.1 If there is no prospective determination that documents that individuals are not likely to receive in excess of 10 percent of the limits, recording and reporting is required under NRC regulations.
- 5.3.2 If the site has a documented prospective determination documenting that individuals are not likely to receive in excess of 10 percent of the limits, recording and reporting of identified contamination is voluntary, unless the exposure actually exceeds 5000 mrem in the calendar year.
- 5.4 Use Attachment 3, PCE Classification Guideline, to determine if the cause of the alarm should be classified as a PCE.
- 5.5 Alarm set points will be established by the site based on background, instrument efficiency, and hard to detect radionuclides and should alarm when 5000 dpm of radioactivity has been detected.
- 5.6 Sensitivity to the individual's gender must be taken into consideration prior to survey and any decontamination actions.
- 5.7 If an alarm occurs on a contamination monitor then take the following actions:
- 5.7.1 Note the location of the alarm and the activity.
- 5.7.2 Instruct the individual to re-monitor.
- 5.7.3 If no alarm occurs, the individual may exit or proceed to the final exit point for monitoring
- 5.7.4 If second alarm occurs note the location and activity and proceed to step 5.8
- 5.8 In the event of a second alarm, indicating a potential contamination event, immediately take the following actions:

- 5.8.1 Take actions to prevent the spread of contamination in the surrounding area and to other personnel.

NOTE: A frisker is a common term for any hand held count rate instrument using a probe operating in the Geiger-Muller region. The approximate MDA for a frisker is considered to be 100 ccpm

- 5.8.2 In a background area of 200 cpm or less, using a frisker or equivalent instrument, and maintaining a detector-to-surface distance of approximately ½ inch or less, slowly survey the individual with additional focus on suspected areas to determine the location and activity of contamination.

- 5.8.3 Ensure areas are surveyed which could have been partially shielded from the detectors such as arm pits, folds in clothing, or tops of shoes.

NOTE: Perform detail surveys to identify all sources of contamination. It is not uncommon for a worker to have more than one form of contamination from a single event (clothing as well as skin contamination).

- 5.8.4 Individuals can be contaminated in more than one location or by more than one radiological concern. Ensure the individual is thoroughly surveyed.

NOTE: Alpha frisking must be performed slowly and with the detector as close to the object as possible without touching.

- 5.8.5 If the individual was working in an area posted and controlled for alpha contamination then perform a survey using an instrument capable of detecting alpha contamination. If alpha contamination is detected notify RP Supervision.

NOTE: Discrete particles are small, loose, highly radioactive particles sometimes referred to as hot particles. Discrete particles can deliver a large dose to a small area and shall be captured and removed as quickly as possible. By definition discrete particles are greater than 50,000 ccpm.

- 5.9 If the survey indicates the presence of discrete radioactive particles then capture and remove particles.

- 5.9.1 Using proper contamination controls capture the particle.
- 5.9.2 Note the location of the particle (skin or clothing).
- 5.9.3 Document the survey results of the particle using a frisker, or if necessary, an open window ion chamber reading.

**NOTE:** Taking a reading on top and underneath the clothing helps to determine the attenuation being provided by the clothing and is essential data for calculating skin dose assessment.

- 5.9.4 If particle was found on clothing, survey and document the reading obtained on top and underneath the clothing (i.e. area in contact with skin).

**NOTE:** In most cases the particle will be sent for isotopic analysis. However, the activity of the particle can be so significant it can cause a radiological concern. Notify RP Supervision if the particle is 2 mr/hr or greater.

- 5.9.5 Secure the particle in the proper container and label as radioactive material.
- 5.9.6 Send the discrete particle for isotopic analysis.
- 5.10 If the survey indicates facial contamination inside the area normally protected by the sealing surface of a respirator, then the potential for internal contamination exists. Shower the individual as appropriate and perform a whole body count.
- 5.11 If the survey indicates beta/gamma contamination on clothing then take the following actions:
  - 5.11.1 Remove the clothing using proper contamination controls to prevent the spread of contamination to other parts of the body or the surrounding area.
  - 5.11.2 Survey the area where the clothing was removed with a frisker. If there are no indications of contamination instruct the individual to re-monitor in beta and gamma exit monitors.
  - 5.11.3 Prior to the decontamination or disposal of the contaminated clothing ensure all survey data, or isotopic analysis, has been obtained to support skin dose assessments.
- 5.12 If the survey indicates contamination on the skin, other than the facial area, then take the following actions:

5.12.1 Decontaminate the skin using one of the methods listed in section 6.3.

NOTE: Personnel may be concerned about the potential health effects of being contaminated. If during the decontamination process you note a level of concern by the individual contact an RP Supervisor who can explain the process and the low level of risk involved.

5.12.2 Survey the area and ensure the contamination has been removed. If contamination is still indicated repeat the decontamination process up to three times. If contamination is still indicated contact RP Supervision.

5.12.3 If survey indicates contamination has been removed instruct the individual to re-monitor in beta and gamma exit monitors.

5.13 If survey indicates the contamination is from naturally occurring isotopes or noble gas then take the following actions:

5.13.1 Instruct the individual to remain in the area to allow for decay, and re-monitor after approximately 30 minutes.

5.13.2 If preferred, the individual can replace the clothing suspected to be contaminated with naturally occurring isotopes or noble gas and re-monitor. If no alarm occurs the individual can exit the area.

5.13.3 If counts have not decreased after 30 minutes then the activity may not be from natural products or noble gas. Re-survey for other causes of contamination alarms.

5.13.4 Section 6.2.5 provides additional guidance for release of personnel with suspected naturally occurring isotopes or noble gas contamination.

5.14 Contamination events can often involve multiple personnel. Take the following actions as appropriate to maintain contamination control. Actions can be taken in any order.

5.14.1 If multiple personnel indicate signs of contamination contact RP Supervision for additional assistance.

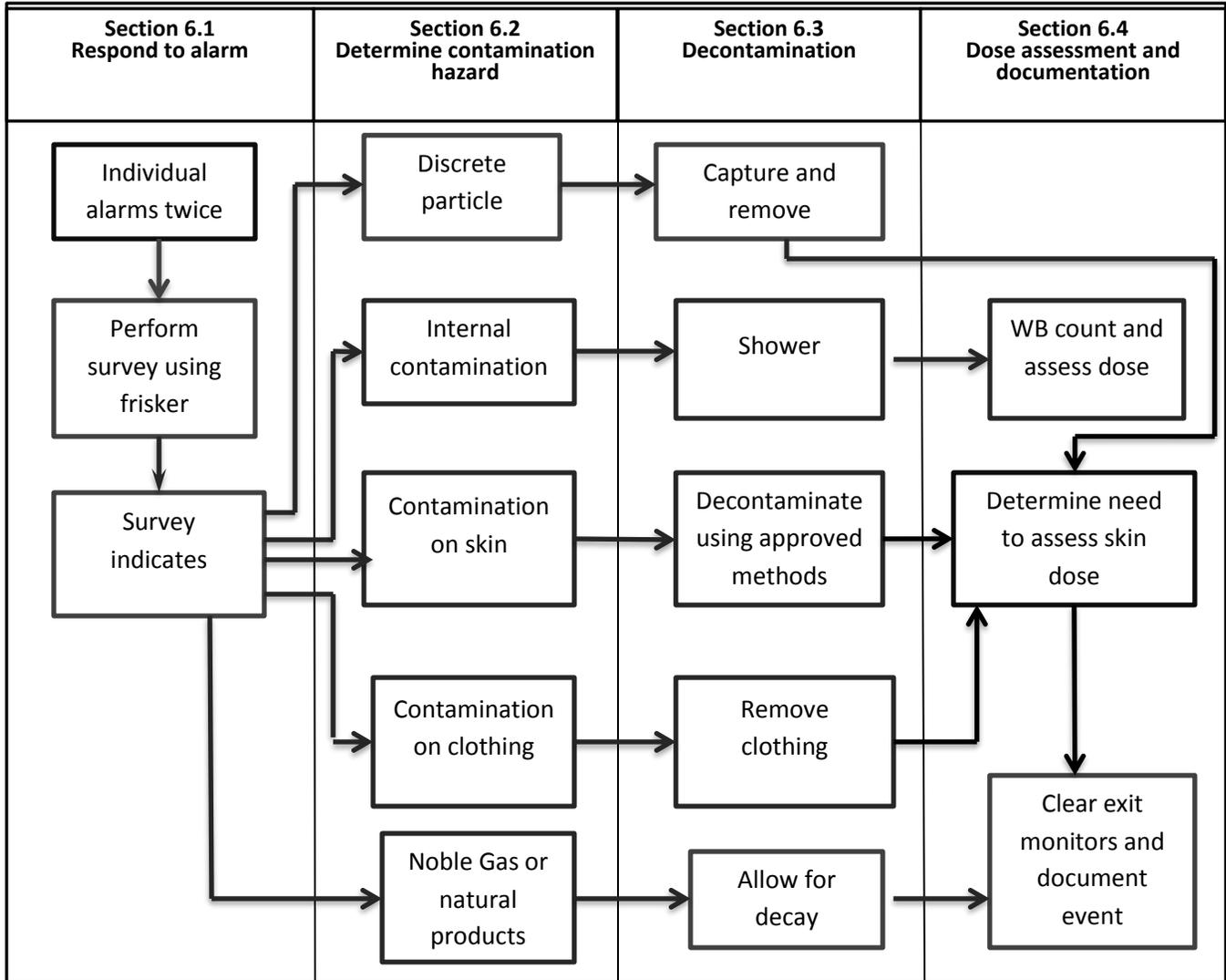
5.14.2 Maintain contamination control by keeping those individuals suspected of contamination segregated in one area. Provide instructions to individuals on where they should be located and why.

5.14.3 If the event involves foot contaminations provide protective shoe covers or mats to prevent the spread of contamination to clean areas while individuals are being processed.

- 5.14.4 As quickly as possible, determine the cause of the event and the route taken to the monitoring location so additional contamination surveys can be performed in the appropriate locations to prevent additional contamination events.
- 5.14.5 If the individuals indicate potential internal contamination, alert RP Supervision so air samples can be obtained from the work area.
- 5.15 Perform follow-up actions as indicated below:
- 5.15.1 Notify RP Supervision when a personnel contamination event occurs.
- 5.15.2 Gather as much information as possible from the individual(s) involved to help determine the cause of the event and provide this information to RP Supervision. Questions to consider are listed below:
- a. Was there a failure of protective clothing?
  - b. Has a leak or spill occurred?
  - c. Was there a failure of HEPA ventilation / Vacuum equipment in the area?
  - d. Was there grinding, burning, or flapping on potentially contaminated surfaces?
  - e. Has there been a change in work scope or work process such as implementation of a different tool or opening of a different component?
  - f. Is there a reason to suspect the contamination levels at the work site may have changed?
  - g. Have the environmental conditions (increase in temperature) at the work site changed?
- 5.15.3 Follow up surveys should be taken in the work area to ensure contamination hazards have not changed, as applicable.
- 5.15.4 If the event involves shoe contaminations then surveys should be taken from the work location to the monitoring location to ensure a spread of contamination has not taken place.
- 5.15.5 Once all of the data has been gathered document the event in accordance section 6.4. If documented on Attachment 1, Personnel Contamination Event, determine the cause code using the following codes (required for level 2 and 3 PCEs only):
- a. R1 – Clean area: Contamination occurred outside of a posted contamination area.

- b. R2 – Poor work practice: Contamination occurred due to, for example, worker not dressed out properly, not following RWP instruction, not undressing properly, or touching exposed skin inappropriately.
- c. R3 – Inadequate rad controls: Contamination caused by, for example, a failure to prescribe adequate protective clothing, inadequate decontamination or control of contamination, or an unnoticed change in radiological conditions.
- d. R4- Equipment failure or spill related: Contamination occurred due to equipment failure (such as valve leak) or an spill (such as improper valve manipulation)
- e. R5 – Protective clothing: Contamination caused by defect of the protective clothing such as a tear, or caused by existing contamination of the protective clothing. This code may also be used when it is determined that “wicking” or “sweat through” of the PCs has occurred while in the respective work area.

**6.0 Process**



**6.1 Respond to second contamination monitor alarm**

- 6.1.1 Perform a survey using a frisker of the locations indicated by the exit monitor.
- 6.1.2 Personnel with 100 cpm or greater are considered contaminated and actions must be taken to remove the contamination before they are released, or in the case of internal contamination, the dose assessment process has been started.
- 6.1.3 Notify RP Supervision of exit monitor alarms so actions can be taken to prevent additional contamination events from occurring.
- 6.1.4 Once an individual has alarmed an exit monitor they must clear the same type of monitor before being released.

- 6.1.5 It is essential that communications be effective between the RP Technician and the worker when responding to a contamination alarm. Use Attachment 2, Communication Guidelines, for methods to ensure communications are effective.
- 6.1.6 Take the following actions when responding to a contamination monitor alarm at the exit to the protected area.

**NOTE:** If no alarm occurs during re-monitoring consider the possibility of a source of radiation could have passed by the exit monitor resulting in an increase in background while the individual was monitoring.

- a. Validate the alarm by asking the individual to re-monitor. If no alarm occurs the individual may be released. If alarm occurs note the location of the alarm and perform a survey using a frisker or equivalent instrument of the individual with additional focus on the alarm zone.
- b. If contamination is detected then determine the following:
- Has the individual recently received medical testing involving radionuclides?
  - Is the alarm caused by naturally occurring radioactive material such as tungsten welding rods?
  - If the contamination is not from medical or naturally occurring radionuclides then control the affected area to prevent a spread of contamination during transport of the individual. This could include wrapping the affected areas, or if contamination is on the shoe, removing the item and placing in a bag.
  - Notify RP Supervision of survey results and request assistance if necessary.
  - Transport the individual to the normal RCA exit point and complete additional surveys and decontamination as necessary.
  - Survey the exit area and travel path of the individual to ensure no contamination spread occurred during the event. Document all surveys.

## **6.2 Determine contamination hazard**

### **6.2.1 Discrete particles**

- a. High count rate in a small localized area can be an indication of a discrete particle.

6.2.2 Internal contamination

- a. Approximate equal counts on front of chest and back can be an indication of internal contamination.
- b. Facial contamination inside the area normally protected by the sealing surface of a respirator.
- c. The inability to pass a gamma monitor, when alarms occur in the upper region of the body, can be an indication of internal contamination.
- d. If radioactivity is detected around the nose, request an individual to blow their nose on a tissue. Treat the item as potentially contaminated and analyze for presence of contamination. Any indications of radioactive material would suggest the possibility of internal contamination. Perform a whole body count and complete dose assessment if required.

6.2.3 Contamination on skin

- a. Evaluate the need for a skin dose assessment based on the criteria in 6.4.5.

**NOTE:** Operating experience has shown that there is potential for significant alpha exposure from cuts or wounds. Mitigation of exposure through decontamination efforts is vitally important in the early phases of the incident. RP Supervision will provide guidance for specific surveys and additional decontamination actions.

- b. If contamination is in or around an open wound notify RP Supervision immediately and treat as an internal contamination event and ensure a dose assessment is completed.

6.2.4 Contamination on clothing

- a. Folds or layers of clothing can act as a shield. Ensure all areas are thoroughly surveyed.

6.2.5 Noble gas or naturally occurring radioactivity

- a. Low level counts evenly spread over a wide area can be an indication of noble gas or naturally occurring radioactive material.
- b. Clothing (i.e. polyester) capable of carrying a relatively high electrostatic charge typically in high friction areas such as the knee and elbow are more likely to attract naturally occurring radioactivity.

- c. If the affected zone is 300 ccpm or less when monitored with a Geiger-Muller type frisker, and the net beta count to net alpha count ratio is between 0.4 and 5.0, then consider the contamination to be radon decay products.
- d. Naturally occurring radioactive material have a half-life less than 30 minutes. Allow for time to decay and re-monitor. If counts are decreasing it can be an indication of noble gas or naturally occurring radioactivity.
- e. Individuals can be conditionally released with radon or noble gas under the following conditions:
  - RPM/Designee has approved the conditional release
  - Radon or noble gas has been confirmed to be the cause of the alarm by step 6.2.5.C. above, or individual has exited from confirmed noble gas or radon area.
  - Individual was not working in a posted contaminated area.
  - Individual is instructed to re-monitor prior to exit from the site.

### **6.3 Personnel Decontamination**

- 6.3.1 If an injury has occurred the medical needs take precedence over the decontamination process.
- 6.3.2 Only ANSI qualified RP Technicians can perform or direct decontamination activities on personnel.
- 6.3.3 Medical assistance is required for decontamination of wounds or around the eyes or for decontamination methods other than those listed in this procedure.
- 6.3.4 The gender of the individual and privacy should be taken into consideration during the decontamination process.
- 6.3.5 Effective communications is essential between the RP Technician and the worker during the decontamination process. Use Attachment 2, Communication Guidelines, to ensure effective communications.
- 6.3.6 Proper contamination controls must be used by the RP technician while performing or assisting in personnel decontamination. As a minimum this includes wearing protective gloves.
- 6.3.7 To decontaminate a discrete particle on clothing, capture with masking or duct tape.
- 6.3.8 To decontaminate a discrete particle on skin, capture with Wet One wipe or similar material.

- 6.3.9 To decontaminate skin use mild soap and tepid water. Observe the skin during the decontamination process and stop if redness of the skin occurs. Three attempts can be made using soap and water. Contact RP Supervision for additional instructions after three attempts, or redness of the skin occurs.
- 6.3.10 RP Supervision/RP Management is required to approve decontamination methods other than those described in steps 6.3.7 through 6.3.9. Consider obtaining medical assistance for aggressive decontamination methods or contamination that needs to be surgically removed. See Attachment 5 for recommendations on other decontamination methods.
- 6.3.11 Contaminated clothing shall be removed taking care not to spread contamination. The area of skin beneath the clothing shall be surveyed to ensure no additional contamination is indicated.
- 6.3.12 Clothing identified as contaminated, cannot be returned unless it has been decontaminated and worn through the contamination monitors by the individual.
- a. If decontamination is completed later, and the individual is not available, then the clothing can be released based on requirements in NISP-RP-07, Control of Radioactive Material.
- 6.3.13 If natural occurring radioactive material or noble gas is suspected individuals can be decontaminated by allowing for radioactive decay.
- 6.3.14 To be released, individuals must successfully pass beta/gamma personnel monitors without alarming. In some cases, such as internal contaminations or incomplete decontamination, individuals may cause an alarm but can only be released with the approval of the RPM. Document the release of the individual using Attachment 6.
- 6.3.15 **If** contamination exceeds Action Level 2 threshold and initial decontamination is not successful, **PERFORM** a preliminary skin dose assessment prior to releasing the individual from site.

#### **6.4 Dose assessment and documentation**

- 6.4.1 Personnel Contamination Events can be documented using attachments in this procedure, equivalent site forms, or electronic processes. Use attachment 3, PCE Classification Guidelines, to help determine if the event should be documented as a PCE.
- 6.4.2 All personnel contamination events are documented on Attachment 4, Personnel Contamination Event Log.
- 6.4.3 Level 2 and 3 personnel contamination events (PCEs) are documented on Attachment 1, Personnel Contamination Event.

- 6.4.4 Documentation is not required for events involving noble gas, medical radioisotopes, naturally occurring radioactive material, or contamination <100 ccpm.

NOTE: Based on site specific isotopes of concern the station may complete a prospective analysis and provide additional guidance for when skin dose assessments are required. Skin dose shall be assessed if there is the potential for 500 mrem or greater. The station may voluntarily decide to calculate and assess skin dose at a value lower than 500 mrem

- 6.4.5 Dose assessment is required for any of the following:

NOTE: Take into consideration the need to assess for alpha exposure based on the radiological hazards from the work area.

- a. Suspected internal contamination.
- b. Contaminated wound
- c. Discrete particle exposure of  $\geq 50,000$  ccpm.
- d. Skin contamination of  $\geq 50,000$  ccpm.
- e. Contamination on skin is  $\geq 250,000$  ccpm-hours (count rate (ccpm) X time (in hours))

## **7.0 Records/Documentation**

- 7.1.1 Retain completed Attachments in accordance with the provision of the stations records management program.
- 7.1.2 Computer generated equivalents may be used in place of the Attachments provided that, at a minimum, the appropriate information contained on the Attachment is contained on the equivalent.

## **8.0 References**

### **8.1 Commitments**

NONE

### **8.2 General**

- 8.2.1 INPO 05-008, Radiation Protection at Nuclear Power Plants
- 8.2.2 EPRI Technical Report 3002009426, Guidelines for Industry Response to Personnel Contaminations, Rev 1.1 December 2016

8.2.3 EPRI Alpha Monitoring and Control Guidelines for Operating Nuclear Power Stations, Revision 2, August 2013.

**9.0 Attachments**

9.1 Attachment 1 – Personnel Contamination Event - Sample

9.2 Attachment 2 - Communication Guidelines

9.3 Attachment 3 - PCE Classification Guidelines

9.4 Attachment 4 - Personnel Contamination Event Log – Sample

9.5 Attachment 5 – Personnel Decontamination Methods

9.6 Attachment 6 – “Sample” Contaminated Individual Release Form

**ATTACHMENT 1  
Personnel Contamination Event – Sample  
Page 1 of 2**

|              |                         |             |             |
|--------------|-------------------------|-------------|-------------|
| Log #: _____ | *Action Level    2    3 | Date: _____ | Time: _____ |
|--------------|-------------------------|-------------|-------------|

*Action Level – circle the appropriate level – (Action Level 2 is > 5,000 ccpm - 50,000 ccpm), (Action Level 3 is > 50,000 ccpm).*

**Section 1 – Event General Information**

Name of Individual: \_\_\_\_\_ ID #: \_\_\_\_\_

Time/Date of Detection: \_\_\_\_\_ / \_\_\_\_\_ Estimated Exposure Time: \_\_\_\_\_ hours

RWP and Task #: \_\_\_\_\_ Individual's Department or Company: \_\_\_\_\_

Unit/Building/Elevation/Room/etc: \_\_\_\_\_

Survey Instruments (ID# / Cal. Due Date): \_\_\_\_\_ / \_\_\_\_\_    \_\_\_\_\_ / \_\_\_\_\_

IF above Instrument used for Skin Dose Assessment, verify current source checked, Initial/date \_\_\_\_\_ / \_\_\_\_\_

Brief Description of Incident: \_\_\_\_\_

---

**Section 2 – Clothing/Shoes**

| <u>Item Contaminated:</u> | <u>Original Activity</u> | <u>*Type of Contamination</u> |                            |
|---------------------------|--------------------------|-------------------------------|----------------------------|
| _____                     | _____ ccpm               | <input type="checkbox"/> 1    | <input type="checkbox"/> 2 |
| _____                     | _____ ccpm               | <input type="checkbox"/> 1    | <input type="checkbox"/> 2 |
| _____                     | _____ ccpm               | <input type="checkbox"/> 1    | <input type="checkbox"/> 2 |

*\* Type of contamination – check appropriate box (1) – distributed contamination (2) – discrete radioactive particle*

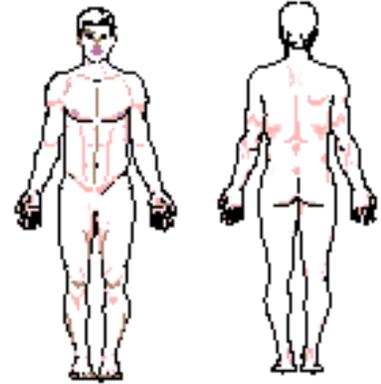
Disposition of Clothing:     Decontaminated     Disposal     Other (Specify) \_\_\_\_\_

**ATTACHMENT 1  
Personnel Contamination Event – Sample  
Page 2 of 2**

**Section 3 – Skin**

Contaminated       Not Contaminated       Facial Region?

| Body Location | *Type of Contamination                                | Initial Activity in ccpm | Activity After 1 <sup>st</sup> Decon | Activity After 2 <sup>nd</sup> Decon | Activity After 3 <sup>rd</sup> Decon | Approx Exposure Time | Final Activity |
|---------------|---|--------------------------|--------------------------------------|--------------------------------------|--------------------------------------|----------------------|----------------|
|               | 1 <input type="checkbox"/> 2 <input type="checkbox"/> |                          |                                      |                                      |                                      |                      |                |
|               | 1 <input type="checkbox"/> 2 <input type="checkbox"/> |                          |                                      |                                      |                                      |                      |                |
|               | 1 <input type="checkbox"/> 2 <input type="checkbox"/> |                          |                                      |                                      |                                      |                      |                |
|               | 1 <input type="checkbox"/> 2 <input type="checkbox"/> |                          |                                      |                                      |                                      |                      |                |



*\* Type of contamination – check appropriate box (1) – distributed contamination (2) – discrete radioactive particle*

**Decontamination Outcome:**

Successful       Contamination Remains (Specify Location/Level): \_\_\_\_\_

Decontamination method \_\_\_\_\_

Decontamination Completed: Date: \_\_\_\_\_ Time: \_\_\_\_\_ RP Initials and ID #: \_\_\_\_\_/\_\_\_\_\_

The decontamination process was explained to me and I have been given an opportunity to have any questions/concerns about this event answered to my satisfaction.

Individual Print/Sign: \_\_\_\_\_/\_\_\_\_\_ Date: \_\_\_\_\_ Phone (ext): \_\_\_\_\_

**Section 4 – Cause Codes**

Select the most appropriate cause code based on data from the event from the table below.

- R1 Clean Area       R2 Poor Work Practices       R3 Inadequate Rad Controls  
 R4 Equipment Failure or event       R5 Protective Clothing Failure

**Section 5 – Additional information**

\_\_\_\_\_  
 \_\_\_\_\_  
**PCE Record Completed By Print/Sign:** \_\_\_\_\_/\_\_\_\_\_ **Date:** \_\_\_\_\_  
**Reviewed By Print/Sign** \_\_\_\_\_/\_\_\_\_\_ **Date:** \_\_\_\_\_

**ATTACHMENT 2  
Communication Guidelines  
Page 1 of 1**

1. Avoid using slang terms which can cause confusion or anxiety with the worker such as “crapped up” or “you’re hot”.
2. Take into consideration the gender of the individual. Typically the same gender will support the surveying requirements for a contamination monitor alarm.
3. Explain your actions before you take them. Help the worker understand the reason for the action.
4. Be sensitive to the workers concerns. This may be the first time they have experience a contamination monitor going into alarm and may have true anxiety. Explain the low level detection ability of the unit. If needed, provide an opportunity for the individual to speak to the RPM or RP Management about personnel monitoring.
5. Provide accurate survey results to the worker in ccpm.
6. If decontamination is required explain the process before any actions are taken.
7. Ensure the individual that their privacy will be protected at all times.

**ATTACHMENT 3  
PCE Classification Guidelines  
Page 1 of 1**

| <b>PCE Classification upon Alarm at or Within RCA Boundary Caused by:</b> | <b>Classification</b> |
|---|-----------------------|
| Noble Gas/Radon   | Not PCE               |
| Medical Radioisotopes   | Not PCE               |
| Contamination <100 ccpm   | Not PCE               |
| Personal Items: Shoes, Personal Clothing, Lanyards, Glasses*              | PCE                   |
| Modesty Clothing  | PCE                   |
| DLR   | Not PCE               |
| SRD   | Not PCE               |
| Internal Contamination Only   | Not PCE               |
| Firefighting equipment  | Not PCE               |
| Ice Vest  | Not PCE               |
| Hard Hat  | Not PCE               |
| Work Gloves   | Not PCE               |

\*Safety glasses provided by the station would not be counted as PCE.

# Nuclear Industry Standard Process Personnel Contamination Monitoring

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## Attachment 4 Personnel Contamination Event Log – Sample Page 1 of 1

| PCE # <sup>1</sup> | Date/Time | Name/ID# | RWP and Task # | Work activity | Work location | Activity level in ccpm <sup>2</sup> | Discrete Particle   | Skin/<br>Clothing  | Decon Successful /Time   | Inst. # | RP Tech Print/Sign |
|--------------------|-----------|----------|----------------|---------------|---------------|-------------------------------------|---|--|--|---------|--------------------|
|                    |           |          |                |               |               |                                     | <input type="checkbox"/> Yes<br><input type="checkbox"/> No | <input type="checkbox"/> Skin<br><br><input type="checkbox"/> Clothing | <input type="checkbox"/> Yes<br><input type="checkbox"/> No<br>_____ |         |                    |
|                    |           |          |                |               |               |                                     | <input type="checkbox"/> Yes<br><input type="checkbox"/> No | <input type="checkbox"/> Skin<br><br><input type="checkbox"/> Clothing | <input type="checkbox"/> Yes<br><input type="checkbox"/> No<br>_____ |         |                    |
|                    |           |          |                |               |               |                                     | <input type="checkbox"/> Yes<br><input type="checkbox"/> No | <input type="checkbox"/> Skin<br><br><input type="checkbox"/> Clothing | <input type="checkbox"/> Yes<br><input type="checkbox"/> No<br>_____ |         |                    |

**RP Supervisor Review**

Reviewed By Print/Sign: \_\_\_\_\_ / \_\_\_\_\_ Date: \_\_\_\_\_

Instruction notes

1. Next sequential number starting at YY-XXX.
2. Record activity for all locations found, including inside/outside as applicable.

**Attachment 5  
Personnel Decontamination Methods  
Page 1 of 1**

**NOTE: RP Supervision approval must be obtained prior to using these methods. If decontamination is unsuccessful, contact the Radiation Protection Manager to release the individual. Document release of individual on Attachment 6, Contaminated Individual Release Form.**

| <b>Situation</b>  | <b>Method</b>   |
|---|---|
| Persistent Contamination (i.e. 3 or more attempts)  | <ol style="list-style-type: none"> <li>1. Form a paste using mild detergent and warm water.</li> <li>2. Scrub Affected Area</li> <li>3. A brush May Be used, applying light pressure</li> <li>4. Rinse with lukewarm water, then pat dry.</li> </ol> <p>A more abrasive paste can be formed using a 50/50 mixture of cornmeal and detergent. Scrub the area as described above.</p> <p>An alcohol-soaked swab may be used for persistent skin contamination</p> |
| <u>Embedded Contamination</u>   | If contamination appears to be embedded in the skin, wrap the affected area with plastic, seal the ends, and place the wrapped area under warm water for 10 to 20 minutes to promote sweating. Remove the plastic and wash the area with mild soap and warm water.  |
| <u>Oily or Greasy Contamination</u>   | Wash the affected area with a waterless hand cleaner. Rub the area for 2 or 3 minutes; wash with a mild soap and warm water. Pat dry.   |
| <u>High Specific Activity Ionic Salt (e.g. Na-24)</u><br><br><i>High specific activity contamination can cause high skin doses if <b>not</b> removed as soon as possible. Normal decontamination methods using soap and water are ineffective in removing Na-24 tracer solutions.</i> | <ol style="list-style-type: none"> <li>1. Moisten a cotton ball or gauze pad with a liquid solvent such as methanol, ethanol, or a mix and apply to contaminated area. Repeat application, if required.</li> <li>2. Remove solvent with soap and lukewarm water.</li> <li>3. Apply moisturizing lotion with lanolin or petroleum jelly once contamination has been removed.</li> </ol>  |

**Attachment 6**  
**“Sample” Contaminated Individual Release Form**  
**Page 1 of 1**

The following information is being provided to document the release of \_\_\_\_\_  
from the (Circle all applicable) Restricted Area / Protected Area with the levels of contamination specified below:

a. The above-named individual is contaminated as listed below:

External Contamination: \_\_\_\_\_ / \_\_\_\_\_  
dpm / Body Location

Internal Deposition (Uptake/Intake): \_\_\_\_\_ nCi

b. The individual has been briefed and has had an opportunity to ask questions concerning their release and the following special requirements imposed:

-  Follow-Up WBC Required  Daily WBC Required

-  Bioassay Required

- \_\_\_\_\_  
- \_\_\_\_\_

c. The individual has agreed to return to the site and report to the RPS on the following dates for additional monitoring:

\_\_\_\_\_ Date \_\_\_\_\_ Time \_\_\_\_\_

Submitted (Print/Sign): \_\_\_\_\_ Date: \_\_\_\_\_

Recommended: (RPS) (Print/Sign) \_\_\_\_\_ Date: \_\_\_\_\_

2. I \_\_\_\_\_ (Print) understand that I am being released with external / internal contamination and agree to the special requirements imposed as described above.

Contaminated Individual (Sign): \_\_\_\_\_ Date: \_\_\_\_\_

3. IR# is generated for the WBC and release of the contaminated individual is approved.

Approved by: \_\_\_\_\_ Date: \_\_\_\_\_  
Radiation Protection Manager (Print/Sign)

4. Notify Plant / OCC Manager.

Notification made by: \_\_\_\_\_ Date: \_\_\_\_\_  
RP Supervision (Print/Sign)