

**NUCLEAR INDUSTRY STANDARD PROCESS**  
**Radiological Protection**  
Level 3 – Information Use

**Training and Qualification of Supplemental RP Technicians**  
**NISP-RP-012**

**Revision: 03.1**

**Industry Approval Date: 10/28/2019**

*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.*

**Nuclear Industry Standard Process**  
**Training and Qualification of Supplemental**  
**RP Technicians**

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### 1.0 Purpose

- 1.1 This procedure describes the process for training and qualifying supplemental RP technicians to perform Common Industry RP Tasks (CIRP Tasks) and to maintain CIRP Task qualifications for portability among nuclear sites. CIRP Task qualifications are required beginning in January 2018 to implement Nuclear Industry Standard Processes (NISP) that will also be effective in January 2018.
- 1.2 This procedure also describes how an Industry Training Oversight Committee (ITOC) will be used to consistently apply this program across the industry.

### 2.0 Scope

- 2.1 The forms referenced by this procedure are 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.
- 2.2 What is a CIRP Task?
  - 2.2.1 A CIRP Task defines a scope of work, as described in Attachment 1, for which a supplemental technician must be trained and qualified. The scope of work defined in each CIRP Task is aligned with the instructions provided in NISP-RP-001 through NISP-RP-010 as follows:
    - a. Each NISP specifies the tasks required to accomplish the scope and purpose of the NISP and provides instructions for each task.
    - b. A CIRP Task number of RP2.XX defines the scope of work that can be performed by a qualified Junior Technician.
    - c. A CIRP Task number of RP3.XX defines the scope of work that can be performed only by a qualified Senior Technician.
    - d. The XXX in the CIRP Task number refers to the NISP number that provides the instructions to perform the scope of work specified by the CIRP Task. For example, RP2.05 defines the scope of work that a Junior Technician can perform in implementing NISP-RP-005, *Access Controls for High Radiation Areas*; RP3.05 defines the scope of work that only a Senior Technician can perform.
- 2.3 How is the Systematic Approach to Training applied?

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- 2.3.1 The Systematic Approach to Training (SAT) is applied using the forms and checklists established by EPRI to support Standardized Task Evaluations (STE) as described in Reference 8.2.4. The EPRI website is used to maintain the final versions of the SAT products. SAT products for each CIRP Task include the following:
- a. A Task Analysis lists the applicable tasks and elements from the NISP with the following:
    - Performance standards
    - Critical steps
    - Knowledge requirements
    - Skill requirements
    - Cognitive enabling objectives
    - Performance enabling objectives
  - b. A Task Objective Form specifies the following:
    - Cognitive level requirements (knowledge, comprehension, or application) and the number of questions required for evaluation of each cognitive enabling objective on a 25 question knowledge exam.
    - Evaluation methods (simulate or perform) that may be used for each performance enabling objective.
  - c. A knowledge examination may be downloaded or taken directly on the EPRI website.
  - d. A performance evaluation can be downloaded and used to evaluate and document if a trainee passes or fails each performance objective. The administrative process for evaluation is also included in the downloaded document.
- 2.3.2 SAT products that are not developed under the EPRI STE process but maintained on the EPRI website for use by the industry include the following:
- a. A PowerPoint lesson plan may be downloaded to provide the training needed to achieve the cognitive enabling objectives.

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- b. An Incumbent Evaluation provides a gap analysis between CIRP Tasks and the NEI Skills described in Reference 8.2.6 to identify the gap training needed to equate and transfer NEI Skill qualifications to CIRP Task qualifications.

2.4 How will position qualifications be defined?

2.4.1 Position qualifications will be maintained in PADS beginning in 2018 using the following criteria:

- a. Senior ANSI 3.1 Technician: All CIRP Task qualifications have been granted, ANSI 3.1 experience requirements have been met, and continuing training requirements have been met.
- b. Senior ANSI 18.1 Technician: All CIRP Task qualifications have been granted, ANSI 18.1 experience requirements have been met, and continuing training requirements have been met.
- c. Senior Task Only ANSI 3.1 Technician: ANSI 3.1 experience requirements have been met but not all CIRP task qualifications have been granted. Continuing training requirements have been met.
- d. Senior Task Only ANSI 18.1 Technician: ANSI 18.1 experience requirements have been met but not all CIRP task qualifications have been granted. Continuing training requirements have been met.
- e. Junior Technician: All junior level CIRP Task qualifications have been granted and continuing training requirements have been met. ANSI experience requirements are NOT met.
- f. Junior Task Only Technician: Only a portion of junior level CIRP Task qualifications have been granted. ANSI experience requirements are NOT met.

2.4.2 Beginning in 2018, Attachment 5 shall be used to determine how experience will be evaluated and credited towards ANSI qualifications if the experience did not involve radiological surveillance and control of areas and work in a nuclear power plant. The adoption of standard criteria will not change a technician's ANSI qualification status as previously determined by a utility. The standard criteria are applicable to ANSI experience evaluations beginning in January 2018.

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- 2.4.3 The 2018 continuing training course for NISP gap training must be completed to attain any CIRP Task qualification using Attachment 3 regardless of position. Beginning in 2019, annual continuing training must be completed by Senior Technicians and Junior Technicians to maintain position qualification. Technician's position qualification status is considered "suspended" or "not current" if training courses from previous years have not been completed per the following requirements:
- a. If CIRP task qualifications have been granted based on NEI skills per Attachment 3, the 2018 continuing (gap) training must be completed.
  - b. Technicians classified as a Junior Technician, Senior Task Only Technician, or Senior Technician prior to 2019, must complete continuing training in 2019 and subsequent years.
  - c. Technicians attaining a Junior Technician, Senior Task Only Technician, or Senior Technician position qualification in 2019 or afterwards, must complete continuing training for the year of attaining position qualification and subsequent years.
- 2.4.4 Qualifications may be reinstated by completing the past continuing training courses that were missed unless; beginning in 2022, a technician has not completed any of the continuing training provided during the previous three calendar years. In such cases, the technician must complete initial training for task qualification as described in this procedure.
- 2.4.5 Equivalency evaluations that justify the granting of CIRP Task qualifications without using the STE process shall be retained as auditable records.
- 2.4.6 PADS codes for continuing training in 2019 will be formatted RPCTXX with XX being the year of the training. Examples are shown below:
- a. RPCONT: 2018 continuing training; GAP training
  - b. RPCT19: 2019 continuing training
  - c. RPCT20: 2020 continuing training
  - d. RPCT21: 2021 continuing training
- 2.4.7 The PADS code for an annual continuing training course will be established when the course is initially published. Site LMS programs should be updated each year to include the new PADS code.
- 2.4.8 Report logic to determine the continuing training required to maintain a position qualification is provided below:

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- a. If PADS lists NEI skills used for equivalencies per Attachment 3:
  - RPCONT is required
  - Annual continuing training beginning in 2019 and thereafter is required.
- b. If PADS does not list NEI skills used for equivalencies, RPCONT is not required.
- c. If PADS does not list JRTECH, AN3.1, or AN18.1, continuing training is not required.
- d. If PADS lists JRTECH, AN3.1, or AN18.1:
  - Determine the earliest data entry of the three
  - Continuing training is required for the year of the earliest entry and subsequent years.

2.5 How will transition to CIRP Task qualifications be accomplished?

2.5.1 Task performance evaluations using the NEI Skills will no longer be administered after 2017. Beginning in 2018, initial task qualification shall be accomplished using the EPRI STE process. Technicians may be granted equivalency for previously completed NEI Skills to transfer previous training to CIRP Task qualifications as shown in Attachment 3.

2.5.2 Gap training will be provided to Senior Technicians, Junior Technicians, and Task Only Technicians to bridge the knowledge and skill differences between the NEI Skills and CIRP Tasks. Once the gap training is completed, a CIRP Task qualification may be granted based on previously completed NEI Skills as shown in Attachment 3. The PADS reports described in Reference 8.2.9 will not show “current” position qualifications unless the gap training is completed. The Task qualifications granted by a utility-specific training program for work within the qualifying utility are not affected.

2.6 What are the requirements for knowledge of fundamentals?

2.6.1 New fundamentals courses will be established in 2018 that will replace the fundamentals course commonly referred to as the NUF. The new courses will consist of a junior fundamentals course, RPFUN1, and a senior fundamentals course, RPFUN2. The transition to adopting RPFUN1 and RPFUN2 will be implemented using the following guidelines:

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- a. Completion of the NUF after December 31, 2012 is equivalent to RPFUN1 until the NUF is removed from NANTeL. The NUF will be removed from NANTeL when the RPFUN1 exam and associated training materials are available on-line.
- b. Completion of the NUF after December 31, 2012 is equivalent to RPFUN1 and RPFUN2 for an ANSI experienced technician who has junior and senior CIRP Task qualifications granted using the equivalency table in Attachment 3.
- c. Technicians who have not been granted any senior level CIRP Task qualifications using Attachment 3 must complete RPFUN2 as a prerequisite to completing senior level STEs. This requirement may be waived until RPFUN2 and associated training materials are available on NANTeL. Suppliers are responsible for identifying technicians granted this waiver to ensure RPFUN2 is completed when available.

2.6.2 Junior Technicians and **Junior** Task Only Technicians who were qualified to perform junior level tasks prior to 2018 without completing the NUF exam will continue to be qualified to perform the equivalent CIRP Tasks with the following restrictions:

- a. RPFUN1 or the NUF, while available, must be successfully completed by the end of 2018.
- b. Additional CIRP Task qualifications may not be granted using the STE process until RPFUN1 or the NUF course has been successfully completed.

2.6.3 The current requirement for Senior Technicians to complete the fundamentals training described by Reference 8.2.6 (NUF exam) every five (5) years was suspended beginning in January 2018. Instead, annual continuing training courses will include refresher training on fundamentals at the discretion of the ITOC.

2.7 Who may administer the EPRI STE process?



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- 2.7.1 Beginning in January 2018, suppliers and utilities may use the EPRI STE process described by Reference 8.2.4 to qualify technicians to perform CIRP Tasks. To use the STE process, a supplier must be deemed by the EPRI STE Steering Committee to be Administrative Protocol for Portable Practicals in Standardized Task Evaluations (AP3) compliant; the supplier's program must contain the attributes described in Reference 8.2.2. Required attributes are specified for workers, evaluators, the evaluation site, evaluation administration, and program improvements. EPRI member utility programs accredited by the National Academy for Nuclear Training may also administer an STE. EPRI membership is required to access the knowledge examinations and performance evaluations maintained on the EPRI website. Member utilities and AP3 compliant suppliers are required to submit records to EPRI for update of the EPRI Task Qualification/Completion Registry (TQR).
- 2.8 How will training equivalency be evaluated?
- 2.8.1 Credit may be given for training provided by entities external to the US nuclear power industry, e.g. a vocational college, the Department of Energy, US Navy, or a foreign utility. Attachment 4 may be used by suppliers to document the basis for equivalency in crediting a course or performance evaluation required for a CIRP Task qualification. Utilities may document equivalency using site-specific procedures. Additional requirements and restrictions for granting an equivalency include the following:
- a. To successfully complete an STE, both the knowledge exam and the performance evaluation must be completed using the EPRI process. An equivalency may not be applied to satisfy either part of an STE.
  - b. The ITOC shall approve, by name, supplier employees who may perform an equivalency evaluation.
  - c. The use of generic equivalency evaluations, e.g. standardized acceptance of DOE qualifications, performed by a supplier must be approved by the ITOC.
- 2.9 How will CIRP Task qualifications be tracked?
- 2.9.1 PADS will continue to be used as the master database to show qualifications of supplemental technicians. Utilities should establish batch transfer programs per Reference 8.2.10 to provide data transfers between site LMS programs and PADS to maintain a single, accurate database for qualifications in PADS.
- 2.9.2 Suppliers and utilities that do not have an automatic LMS/PADS interface may input directly in PADS.
- 2.10 How are records maintained to support CIRP Task Qualifications?

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- 2.10.1 The organization making a PADS entry shall retain supporting quality records and make them available on request. Records supporting PADS entries are maintained as follows:
- a. Utilities maintain records per utility procedures.
  - b. NANTeL provides an electronic record for completion of fundamentals exams.
  - c. NANTeL provides an electronic record for completion of continuing training courses and required exams.
  - d. The EPRI TQR provides an electronic record for completing STE knowledge exams and performance evaluations.
  - e. Suppliers retain resumes and equivalency evaluations using Attachment 4.
  - f. Suppliers retain attendance sheets for continuing training by methods other than NANTeL.
- 2.11 How will continuing training be administered?
- 2.11.1 Continuing training will be provided to maintain the knowledge and skills required to implement the NISPs. The content of continuing training will be the same for both Senior and Junior Technicians. Required exams require a passing grade of 80%. Continuing training for 2018 began in December 2017 and consists of the gap training to implement the NISPs. After 2018, minimum requirements for annual continuing training include:
- a. Significant changes in a RP NISP.
  - b. Any gap training needed due to significant changes in the initial training program.
  - c. Lessons learned from significant operating experience as identified by INPO.
  - d. INPO focus areas based on weaknesses identified during INPO plant performance evaluations.
  - e. Refresher training for fundamentals/systems as determined by the ITOC.
- 2.11.2 Delivery of continuing training will be accomplished using computer-based training (CBT) to the maximum extent reasonable. If a portion of the continuing training cannot be delivered using CBT, the ITOC is responsible for determining how the training will be delivered.

2.11.3 Continuing training does not include refresher training for infrequent, important, and complex tasks due to the large population of supplemental technicians that do not perform such tasks. When such tasks will be performed, the utility is responsible for determining the pre-job training and/or briefing that will be required using plant-specific procedures.

2.12 How will industry oversight be established?

2.12.1 The US nuclear power industry has collaborated to develop and implement the above program through a working group. The working group will transform into the ITOC to provide a representative cross-section of stakeholders that will monitor and maintain the effectiveness of the training program.

### **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 Site Radiation Protection Managers are responsible for site implementation of radiation protection training programs, including supplemental RP Technicians. This includes approval of credited experience for ANSI qualifications, suspension of qualification(s) for unacceptable performance, and determination and conduct of specialty training and qualifications.

4.2 Corporate Functional Area Managers are responsible for oversight of site radiation protection training programs.

4.3 ITOC Chair responsibilities are in section 6.

4.4 ITOC Members responsibilities are in section 6.

4.5 Vendor Suppliers are responsible for administration and coordination of the supplemental RP Technician training and qualification program.

4.6 Site Training Managers/Instructors are responsible for maintaining the RP training program in compliance with regulatory and procedural requirements, and ensuring supplemental RP Technician task qualifications are input into PADS.

4.7 EPRI STE Program Manager is responsible for administering and maintaining the Standardized Task Evaluations for supplemental RP technicians. This includes coordination of activities by the EPRI STE Steering Committee.

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### 5.0 General Requirements

- 5.1 Supplier programs to qualify personnel using the STE process shall be evaluated and approved per Reference 8.2.2, *EPRI Administrative Protocol for Portable Practicals (AP3) in Standardized Task Evaluations*. Reference 8.2.2 describes the following:
  - 5.1.1 The key attributes that must be satisfied in the supplier training program.
  - 5.1.2 The process for program submittal and compliance review.
  - 5.1.3 Requirements for maintaining an approved program.
- 5.2 Administration of knowledge examinations and performance evaluations by suppliers shall conform to the processes described in Reference 8.2.4, *EPRI Standardized Task Evaluation Program Implementation Guide*.
- 5.3 Qualification of a supplemental RP technician to perform a CIRP Task is accomplished by one of the following:
  - 5.3.1 An EPRI STE for the CIRP Task may be administered by an EPRI AP3 compliant supplier or through a program accredited by the National Academy for Nuclear Training.
    - a. Knowledge examinations and performance evaluations on the EPRI website are available only to utilities and suppliers with an EPRI membership.
  - 5.3.2 An equivalency is granted using the provisions of sections 6.4.1 or 6.4.2.
- 5.4 Enabling objectives to achieve qualification for performing CIRP Tasks shall include the following:
  - 5.4.1 Applicable topics from ACAD 93-008 listed in Attachment 1.
  - 5.4.2 Process specific knowledge and skills as determined through the CIRP Task Analysis.
- 5.5 Supplier employees shall be approved by the ITOC to perform the following:
  - 5.5.1 Review and approve equivalency evaluations.
  - 5.5.2 Evaluate previous experience for applicability to ANSI requirements.
  - 5.5.3 Evaluate and remediate unacceptable performance.

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- 5.6 Completed courses, CIRP Task qualifications, and position qualifications shall be entered into the Personnel Access Data System (PADS) with the following minimum information:
- 5.6.1 Course Name – The specific course number or qualification as listed on Attachment 2.
- 5.6.2 Date Completed – Enter the completion date for the type of data entry using the following guidance:
- a. STE Completion: Enter the date when the STE was completed.
  - b. Transfer of NEI Skills: Enter the date when it was determined that, for a CIRP Task, the NEI Skills listed in Attachment 3 have been previously completed. The entry date for completing gap training will be entered separately.
  - c. Completion of RPFUN1 or RPFUN2: Enter the date when each course was completed. Completion dates for the fundamentals training described by Reference 8.2.6 are already in PADS.
  - d. Equivalency Evaluation: Enter the date when it was determined and approved that a CIRP Task qualification has been met through an equivalency evaluation.
  - e. ANSI 18.1 or 3.1 Position Qualifications: Enter the date when the review was completed per section 6.5 of this procedure.
- 5.6.3 Score – PASS or NLQF (No Longer Qualified).
- a. A CIRP Task qualification or position qualification with the code NLQF identifies a suspended qualification due to unacceptable performance or other reasons.
    - Once remediation has been completed, the course or position qualification may be entered with a score of PASS to restore the qualification.
- 5.6.4 Method – Input PERFORMANCE for the codes on Attachment 2.
- 5.6.5 Plant – The PADS plant code or company code for the facility conducting the training or performing the review.
- 5.7 Refer to NEI 03-05 (Reference 8.2.8) for additional data entry instructions as needed.

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- 5.8 During 2020 and 2021, if a Junior or Senior Technician has failed to complete an annual continuing training course provided since 2019, remediation shall be performed as follows:
  - 5.8.1 Complete the CBT courses that were missed.
  - 5.8.2 For non-CBT courses, ensure the senior technician can perform consistent with the enabling objectives through performance evaluation, observation, oral boards, etc. Document the equivalency evaluation using Attachment 4 (suppliers only) or site-specific procedures for equivalency evaluations (utility only).
- 5.9 Beginning in 2022, if a Junior or Senior Technician has failed to complete annual continuing training courses provided during the previous three (3) calendar years, task qualification must be accomplished using the STE process described in this procedure.
- 5.10 Records to support PADS entries are maintained as follows:
  - 5.10.1 Utilities retain records per site-specific procedures.
  - 5.10.2 NANTeL maintains electronic records to show individual completion of RP fundamentals knowledge exams using NANTeL.
  - 5.10.3 EPRI maintains an electronic record showing successful completion of an STE knowledge exam in the EPRI Task Qualification/Completion Registry (TQR).
  - 5.10.4 EPRI maintains an electronic record to show individual completion of an STE performance evaluation in the EPRI TQR per EPRI policy.
  - 5.10.5 The utility or supplier administering an STE is responsible for updating PADS and providing EPRI with the documents required for update of the TQR.
  - 5.10.6 Suppliers maintain records of equivalency evaluations and resumes to support ANSI qualifications indefinitely or until disposal is authorized by the ITOC.
  - 5.10.7 NANTeL maintains electronic records to show individual completion of continuing training, include completion of required exams.
  - 5.10.8 Suppliers maintain attendance records for continuing training that is not delivered using NANTeL.

### 6.0 Process Instructions

The following illustration lists the major process elements in this procedure that implement a systems approach to training.

# Nuclear Industry Standard Process Training and Qualification of Supplemental RP Technicians

Analysis	Design	Development	Implement	Evaluate
<ul style="list-style-type: none"> <li>• Applicable Topics from ACAD 93-008 Define Knowledge &amp; Skills Commensurate with Training of Utility Technicians (Attachment 1)</li> <li>• Task Analysis Identifies Additional Knowledge &amp; Skill Requirements Specific to NISP Processes</li> </ul>	<ul style="list-style-type: none"> <li>• Entry Level Requirements Established</li> <li>• Cognitive Enabling Objectives for Fundamentals Established based on ACAD 93-008</li> <li>• STE Process Establishes:               <ol style="list-style-type: none"> <li>1. Cognitive Enabling Objectives</li> <li>2. Performance Enabling Objectives</li> <li>3. Knowledge Exams</li> <li>4. Performance Evaluation Standards</li> </ol> </li> </ul>	<ul style="list-style-type: none"> <li>• Fundamentals Courses Developed for Web Based Access</li> <li>• Courses Developed for Web Based Access to Support Knowledge Exams</li> <li>• Performance Evaluation Methodology &amp; Acceptance Standards Developed using STE Process</li> </ul>	<ul style="list-style-type: none"> <li>• Web Based Courses Used to Facilitate Self-Paced Training</li> <li>• Wireless Technology Used to Simulate Radiation Levels</li> <li>• Lesson Plans Provide Consistent Delivery</li> <li>• Task Performance Evaluations Specify Performance Standards</li> </ul>	<ul style="list-style-type: none"> <li>• Training Oversight Committee (ITOC) Established</li> <li>• Unacceptable Performance Reported &amp; Evaluated</li> <li>• Training Feedback Solicited &amp; Collected</li> <li>• Annual ITOC Review Determines Training Actions to Improve &amp; Sustain Performance</li> <li>• ITOC Coordinates Training Actions</li> </ul>

## 6.1 Industry Training Oversight Committee (ITOC)

### 6.1.1 INPO Actions

- a. Coordinate with the industry to assign an ITOC Chair

### 6.1.2 ITOC Chair Actions

- a. Coordinate with the industry to select members to the ITOC as follows:
  - ITOC Chair (voting member).
  - Two corporate RPMs (voting members).
  - Two trainers responsible for RP training programs (voting members).
  - Two site RPMs (voting members).
  - A representative from each AP3 compliant supplier administering STEs (voting members).
  - INPO representative (non-voting member).
  - EPRI representative (non-voting member).

### 6.1.3 Select members to achieve a representative cross-section of the industry.

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- 6.1.4 Ensure ITOC meetings maintain the minimum quorum as stated above for issues requiring a vote. A majority vote is required for approval of actions and decisions. Meeting minutes and major decisions will be made available to the industry.
- a. Meeting attendees in addition to the minimum quorum may also vote if they meet the position requirements for voting membership.
- 6.1.5 Review the effectiveness in implementing this procedure at least annually and coordinate improvement actions that may be identified.
- 6.1.6 Provide routine oversight of the training program to ensure the following:
- a. Inclusion of training topics from ACAD 93-008 that provide the knowledge and skills necessary to perform the tasks included in portable qualifications.
- b. The use of web-based training courses to the extent practicable.
- c. An effective interface between PADS and site LMS programs to track and update CIRP Task qualifications.
- d. Identification of training needs to implement new or revised NISPs.
- e. Implementation of a performance monitoring program to identify potential improvements needed in training.
- f. Identification of training needs based on performance monitoring and recent operating experience.
- g. Implementation of training needs identified during ITOC reviews.
- 6.1.7 Review the applicable topics listed in Attachment 1 every 3 to 5 years to ensure training requirements meet the industry's needs.
- a. Revise this NISP as required to maintain Attachment 1 current.
- 6.1.8 Conduct meetings as needed to determine continuing training requirements per section 6.8.
- 6.2 **Knowledge Exams for Initial Training**
- 6.2.1 Proctor Actions
- a. Administer RP Theory Fundamentals exams (RPFUN1 and RPFUN2) using NANTeL.
- Update PADS for successful exam completion either directly or through interface with an updated LMS and automatic interface.

### NOTE

SAT products from the EPRI website are not available to non-EPRI members and may not be used to administer an STE.



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- b. Administer STE knowledge exams per Reference 8.2.4 using the EPRI website or administer manually as described below.
- c. If an STE knowledge exam is to be administered manually, then take the following steps:
  - Download the STE knowledge exam from the EPRI website.
  - Administer the knowledge exam in accordance with the instructions on the knowledge exam and the site training procedures.
- d. Forward the completion form to the EPRI/PADS Point of Contact established by the site or supplier.

### 6.2.2 EPRI/PADS Point of Contact Actions:

- a. If all requirements have been satisfied to complete a CIRP Task qualification, update PADS directly or through interface with a site Learning Management System (LMS).
- b. For manual exams, forward the cover sheet to the EPRI STE Coordinator for retention.

### 6.2.3 EPRI STE Coordinator Actions

- a. Update the EPRI Task Qualification/Completion Registry (TQR) upon receipt of an exam cover sheet.

### 6.2.4 Exam Failures

- a. When a student fails an exam, a second attempt of the exam for the same topic/subject is not permitted until the student reviews the information from the objectives that were missed with the instructor. Before a second exam is administered the student and the instructor are responsible for remediation activities that ensure the student is cognizant of, and understands the content for, each of the gaps identified in the failed exam.
- b. Once the instructor is satisfied that the gaps are closed, a second exam may be administered.
- c. If the student is not successful in completing the second exam, the individual with lead responsibility for administering the supplier's training and qualification program shall be notified.
- d. Upon notification, the supplier training lead administrator shall:

- Review causes for the exam failures with the cognizant instructors;
  - As applicable review feedback from utility RP management,
  - Determine whether a third attempt should be authorized.
- e. If a third attempt of the exam for the same topic/subject is authorized, the supplier training lead administrator shall:
- Specify the prerequisites that must be achieved prior to allowing another attempt;
  - Ensure the prerequisites are achieved by the student
- f. A third failure requires the student to be disenrolled from the program.

### 6.3 Performance Evaluations for Initial Training

<p><b>NOTE</b> SAT products from the EPRI website are not available to non-EPRI members and may not be used to administer an STE.</p>
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#### 6.3.1 Evaluator Actions

- a. Obtain the performance evaluation document by downloading the STE document from the EPRI website per Reference 8.2.4.
- b. Evaluate each performance objective by having the trainee perform or simulate the steps required to accomplish each objective.
- Perform requires actual performance of the steps using the necessary processes, tools, and equipment.
  - Steps may be performed in a non-radiological environment if the following criteria are met:
    - 1) Wireless technology is used for dynamic measurements, e.g. radiation levels change based on the surveyor's location or radiation levels change due to progression through a scenario.
    - 2) Cues are used only for static measurements, e.g. a frisker reading on a smear or the amount of radioactivity on an air sample.

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- 3) Simulator training plans are used to set up the simulated environment, direct changes in wireless parameters based on the scenario presented, specify the exact cues that may be provided, and specify when the cues may be provided.
    - If the performance objective cannot be reasonably performed, the objective may be simulated.
  - 1) Simulation requires the trainee to perform the steps in a representative manner using similar processes, tools, and equipment.
- c. If the trainee successfully demonstrates all of the performance objectives, complete the documentation as instructed by the STE and send the completed documentation to the EPRI/PADS Point of Contact established by the site or supplier.

### 6.3.2 EPRI/PADS Point of Contact

- a. If all requirements have been satisfied to complete a CIRP Task qualification, update PADS directly or through interface with a site Learning Management System (LMS).
- b. Forward the completed cover sheet to the EPRI STE Coordinator.

### 6.3.3 EPRI STE Coordinator

- a. Update the EPRI Task Qualification/Completion Registry (TQR).

## 6.4 Equivalency Evaluations

### 6.4.1 Utilities Actions

- a. Credit the following qualifications and courses as being equivalent to the CIRP Task qualification requirements in Attachment 1.
  - RP Fundamentals (PADS Codes HPC, 2023 & 5261) meet the requirements for the following:
    - 1) RPFUN1 if completed after 12/31/2018.
    - 2) RPFUN2 if completed after 12/31/2018 and senior level CIRP Task qualifications have been granted using Attachment 3.
  - NEI Skills from NEI 03-04 (Reference 8.2.6) meet the requirements for CIRP Task qualifications as listed in Attachment 3.

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- b. Use site-specific procedures to evaluate and credit site courses and Task Performance Evaluations that accomplish the enabling objectives for all or portions of the following:
  - RP Theory Fundamentals for Junior Task Qualifications RPFUN1.
  - RP Theory Fundamentals for Senior Task Qualifications RPFUN2.
  - CIRP Task Analysis.
  - RP Continuing Training for the current year.
- c. Update PADS directly or through interface with the site LMS to add qualifications granted by an equivalency evaluation.
  - The PADS database will reflect that the utility providing the update maintains the records supporting the qualification.
  - The date for completing the equivalency evaluation will be the PADS completion date for the course or qualification.
- d. Utilities that do not have access to PADS should coordinate with the Supplier for PADS update.

### 6.4.2 Supplier Actions

- a. Use Attachment 4 to evaluate and credit courses and qualifications that meet the topics and enabling objectives for the courses and qualifications listed in Attachment 1.
  - Retain Attachment 4 as a record until the technician is no longer available to work as a supplemental RP technician.
  - The date for completing the equivalency evaluation will be the PADS completion date for the course or qualification.
  - Ensure equivalency evaluations are reviewed and approved only by individuals who have been authorized by the ITOC as documented in ITOC meeting minutes.
  - Ensure generic equivalency evaluations are also approved by the ITOC. A generic equivalency evaluation may be used for a specific set of qualifications such as DOE qualifications, Navy qualifications, etc.

### 6.5 Position Qualifications

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### 6.5.1 Utilities & Suppliers Actions

- a. Classify technician positions based on experience and task qualifications. The following guidelines should be used:
- Senior ANSI 3.1 Technician: All CIRP Task qualifications have been granted and ANSI 3.1 experience requirements are met.
  - Senior ANSI 18.1 Technician: All CIRP Task qualifications have been granted and ANSI 18.1 experience requirements are met.
  - Senior Task Only ANSI 3.1 Technician: ANSI 3.1 experience requirements are met but not all CIRP Task qualifications have been granted.
  - Senior Task Only ANSI 18.1 Technician: ANSI 18.1 experience requirements are met but not all CIRP Task qualifications have been granted.
  - Junior Technician: All junior level CIRP Task qualifications have been granted but ANSI experience requirements are NOT met.
  - Junior Task Only Technician: Only a portion of junior level CIRP Task qualifications have been granted and ANSI experience requirements are NOT met.
- b. Use Attachment 5 to evaluate previous experience for comparison to ANSI requirements:
- ANSI 18.1 requirements are met if the experience evaluation shows two or more years of experience (4,000 hours) can be credited toward ANSI qualifications.
  - ANSI 3.1 requirements are met if the experience evaluation shows three or more years (6,000 hours) of experience can be credited toward ANSI qualifications.
    - 1) Related technical training and education may be substituted as experience for ANSI 3.1 qualifications based on 40 hours per week, not to exceed 2,000 hours.
- c. Completion of Attachment 5 is not required if a technician's resume shows ANSI requirements have been solely met by experience as a Junior or Senior RP technician at a nuclear power plant providing radiological surveillance and control of areas and work.

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- d. Ensure only designated approval authorities as listed below review and approve a completed Attachment 5.
  - A site RPM or designated approval authority.
  - A supplier employee approved by the ITOC.
- e. Ensure the PADS database reflects the position experience levels as follows:
  - Input complete for PADS code AN18.1 if ANSI 18.1 experience requirements are met.
  - Input complete for PADS code AN3.1 if ANSI 3.1 experience requirements are met.
  - Input complete for PADS code JRTECH when the Junior Technician position qualification has been, but ANSI experience requirements have not been met.
  - Retain the resume on file as the record holder for the experience evaluation until the individual is no longer available to work as a supplemental RP technician.
- f. If a technician was previously determined to meet ANSI qualifications using plant-specific criteria prior to January 1, 2018 and does not meet the standard criteria in Attachment 5 on January 1, 2018, the plant awarding the ANSI qualification may enter the individual in PADS as ANSI qualified.
- g. Suspend position qualifications for all positions except a Junior Task Only Technician if continuing training has not been completed as required for the previous three years with the first requirement for continuing training beginning in 2019.

### 6.6 Unacceptable Performance

#### 6.6.1 Site RPM or Supplier Actions

- a. If an RP technician does not perform a CIRP Task at an acceptable level, suspend qualifications for performing the applicable task(s).
  - Unacceptable performance is defined as an incident when a technician's performance requires CIRP Task qualifications to be suspended as determined by the site RPM and/or the Supplier Issue Owner.

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- Ensure both the site RPM and the technician's management are aware of the circumstances related to the unacceptable performance.

### 6.6.2 Supplier Actions

- a. Assign a Supplier Issue Owner for each case involving the evaluation and/or remediation of unacceptable performance.
  - Ensure the Supplier Issue Owner has been approved by the ITOC to evaluate technician performance issues.
  - Ensure approval is documented in ITOC meeting minutes.

### 6.6.3 Supplier Site Manager

- a. Upon notification of unacceptable performance, promptly take the following actions:
  - Communicate the issue through the supplier's chain of command.
  - Ensure the issue is entered in the supplier's corrective action program.
    - 1) Update the supplier's corrective action program as site management completes any related investigations to ensure the supplier's management has an archived reference to site investigations.
  - Interview the technician to investigate potential causes, including potential knowledge or skill weaknesses.
    - 1) Ensure interviews are documented and entered in the supplier's corrective action program.
  - If the technician is released from the site without remediation, notify the Supplier Issue Owner to ensure the affected CIRP Task qualifications are suspended in PADS.
    - 1) Enter suspension of PADS qualifications as an assigned action in the supplier's corrective action program to document completion.
    - 2) Suspend a qualification by entering NLQF as the input for the score as described in section 5.6.3 of this procedure.

- Contact the Supplier Issue Owner to determine if additional information or evaluation is needed.

#### 6.6.4 Supplier Issue Owner Actions

- a. Inform the EPRI STE Coordinator that unacceptable performance of an STE has occurred if the CIRP Task qualification was granted using the STE process.
- b. If remediation can be reasonably achieved, determine the remediation actions required to reinstate the affected qualifications.
  - Consult with the site RPM to ensure remediation actions are mutually acceptable.
  - Document the required remediation actions in the supplier's corrective action program along with concurrence by the site RPM.
  - Provide a copy of the final remediation plan to the site RPM.
- c. If effective remediation cannot be reasonably achieved, document the basis for this conclusion in the supplier's corrective action program.
- d. Reinstate the technician's qualifications in PADS only after all remediation actions have been completed and confidence has been restored that the technician can perform the STE task with acceptable performance.
  - If the technician changes employers, the employer desiring reinstatement is responsible for assigning an Issue Owner to oversee remediation.
    - 1) Obtain a copy of the remediation plan from the RPM at the site where unacceptable performance was identified.
  - Document successful completion of remediation actions in the employer's corrective action program with supporting objective evidence.
- e. Update PADS to indicate that remediation has been completed and records for the remediation are available from the employer for review as needed.

#### 6.6.5 Each Supplier Actions

- a. Provide a report to the ITOC Chair by May 1 of each year describing each occurrence of unacceptable performance and related corrective actions over the previous 12 months.



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### 6.7 Training Feedback

#### 6.7.1 Each Supplier Actions

- a. Designate an individual responsible for collecting training feedback.
  - Training feedback on training effectiveness may be received by trainees, observers, and instructors. Examples include:
    - 1) Course reviews.
    - 2) Critiques of exam questions.
    - 3) Effectiveness of performance evaluations.
    - 4) Weaknesses in trainee performance.
    - 5) Strengths and weaknesses in facilities, training materials, and logistics.

#### 6.7.2 Instructors Actions

- a. Ensure trainees understand that training feedback is valued and to submit feedback using Attachment 6 or an email.
  - Provide the name of the individual designated to collect feedback and ask that feedback be provided to this person directly, or
  - Collect feedback and forward it to the designated individual.

#### 6.7.3 Each Supplier Actions

- a. Provide a summary report, from feedback over the previous 12 months, to the ITOC Chair by May 1 of each year describing the training feedback that was received and any recommendations for changing the training program and/or NISPs.

### 6.8 Continuing Training

**NOTE:**

Required continuing training for 2018 will consist of the gap training required to transition NEI Skills to CIRP Task qualifications based on implementing the NISPs in January 2018

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### 6.8.1 ITOC Chair Actions

- a. At least once per calendar year, normally during May, conduct an ITOC meeting to review performance and feedback from the previous 12 months in accordance with section 6.1.

### 6.8.2 ITOC Actions

- a. Conduct an annual performance review using the following information:
  - New or revised NISPs.
  - Cases of unacceptable performance.
  - Training feedback.
  - Recent operating experience documented in INPO Industry Event Reviews (IER).
  - INPO RP focus areas.
- b. Based on the annual performance review, coordinate development of a CBT course to address the following:
  - NISP changes that need to be communicated to supplemental technicians.
  - Changes in the knowledge and skill requirements to achieve a CIRP Task qualification.
  - Lessons learned identified from significant operating experience that need to be understood and applied by supplemental technicians.
  - Behaviors needed to address INPO RP focus areas.
  - Refresher training on fundamentals as needed to address apparent weaknesses from the above review.
- c. Coordinate the use of NANTeL to distribute the continuing training CBT to maximize the use of remote learning and the flexibility for technicians to complete the training based on personal schedules.
  - Each supplier will assign the CBT to the junior and senior technicians who have worked for the supplier during the previous 18 months.

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- d. If completion of a CBT itself is not sufficient to accomplish the enabling objectives for continuing training, determine the following as applicable:
  - Subjects and durations of classroom or laboratory training.
  - Enabling objectives to be evaluated by a proctored exam and the expected completion time.
  - Enabling objectives to be evaluated by a performance evaluation or dynamic learning activity and expected completion times.
  - The facilities, equipment, and instructors required for delivery of the training.
  - Division of responsibilities between utilities and suppliers for delivery of the training.
- e. Coordinate implementation of training not accomplished through a CBT as follows:
  - Assign members of the ITOC to coordinate development of the training materials and establish a schedule for completion.
  - Determine the locations that will be used for delivery and assign ITOC members to coordinate the preparation of facilities, equipment, and instructors for delivery of the training.
- f. Coordinate revisions of the fundamentals courses and/or SAT products on the EPRI website as needed to address the training gaps identified during the annual performance review.
- g. Ensure continuing training courses have been reviewed, prior to delivery, by an instructor qualified through an accredited training program.

### 6.8.3 Suppliers Actions

- a. Coordinate the delivery of the continuing training.

### 6.8.4 Utilities Actions

- a. Prior to each outage, identify any outage activities that will be performed by supplemental personnel that may require just-in-time training due to the infrequent, complex nature of the task.
  - Provide the just-in-time training to the personnel who will be responsible for performing the tasks.

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## **7.0 Records/Documentation**

7.1 Refer to site records retention requirements.

## **8.0 References**

8.1 Commitments

8.1.1 {Insert site procedure number(s), or state 'None'}

8.2 General

8.2.1 Supplemental Personnel Process Description, INPO AP-930, Revision 3, September 2016

8.2.2 Plant Support Engineering: Administration Protocol for Portable Practicals (AP3) in Standardized Task Evaluations, EPRI Technical Report 1021072, November 2010

8.2.3 Guidelines for Training and Qualification of Radiological Protection Technicians, Revision 1, ACAD 93-008, March 2016

8.2.4 EPRI Standardized Task Evaluation Program Implementation Guide, Revision 1, EPRI Technical Report 3002006470, July 2015

8.2.5 Industry White Paper – Meeting ANSI Experience Requirements for Supplemental Radiation Protection Technicians, Willie Harris, August 2018

8.2.6 Guideline for Plant Access and Other Standardized Shared Training Courses and Evaluations, NEI 03-04, Revision 9, October 2016

8.2.7 Radiological Protection Processes, INPO 17-002

8.2.8 NEI 03-05, Personnel Access Data System Operating Manual

8.2.9 NEI System Administrator Bulletin 2017-08—Addition of Radiation Protection Technician Skill/Certification Reports, October 16, 2017

8.2.10 NEI 03-06, Personnel Access Data System Electronic System Technical Documentation

## **9.0 Attachments**

9.1 Attachment 1 – Training Program Description

9.2 Attachment 2 – PADS Codes for CIRP Task Qualifications

9.3 Attachment 3 – Equivalency of NEI RPT Skills to CIRP Task Qualifications

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- 9.4 Attachment 4 – Supplier Training Equivalency Evaluation
- 9.5 Attachment 5 - Credited Experience for ANSI Qualification
- 9.6 Attachment 6 - Training Feedback – Sample

**Attachment 1  
Training Program Description  
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This attachment describes the content of the training program for supplemental RP technicians and lists the learning objectives that are based on ACAD 93-008, the industry task analysis for RP technicians. An industry working group identified the common tasks (defined in NISP-RP-001 through NISP-RP-010) expected to be performed by supplemental RP technicians and then selected the knowledge and skills from ACAD 93-008 that are needed to perform those tasks. The specific knowledge and skills used for initial program development are listed in Revision 1 of this procedure. This attachment is maintained in subsequent revisions to accomplish the following:

- Clarify ACAD topics into learning objectives as needed to clearly state the knowledge and skills that must be acquired through the training.
- Add or delete ACAD topics as needed to accurately encompass the knowledge and skills applicable to supplemental RP technicians. This includes knowledge and skills needed to perform tasks that are added or deleted in the NISPs.
- Add or revise learning objectives as needed based on operating experience.
- Ensure changes to this attachment are reviewed by the ITOC for concurrence. The ITOC provides a review panel composed of subject matter experts.

Knowledge and skills needed to implement the NISP processes that may not be described in the ACAD have been determined through task analysis using EPRI STE processes. Refer to the task analyses on the EPRI STE website for a complete description of knowledge, skills, cognitive enabling objectives, and performance enabling objectives.

### **1.0 Entry Level Requirements**

Entry level candidates must have a high school or equivalent education and the basic mathematical skills to begin the training program. Knowledge and skills must enable the following:

- Use arithmetical functions, fractions, decimals, percentages, square roots, averages, and significant figures.
- Convert, multiply, and divide numbers using scientific notation.
- Apply dimensional analysis to add or equate physical quantities using common units.
- Solve basic algebraic equations.
- Apply basic geometric principles in calculating area and volume.
- Use graphs and control charts to plot information and obtain information using both rectangular and logarithmic coordinates.
- Use exponents and logarithms
- Use basic units such as temperature, pressure, flow, volume, mass, weight, distance, and time.

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**2.0 Junior Technician Training Program**

***2.1 RP Theory Fundamentals for Junior Task Qualifications***

This fundamentals course provides a trainee with the common background knowledge essential for completing the STEs for junior level CIRP Task qualifications. Learning objectives and topics based on ACAD 93-008 include:

- Define atomic structure including atomic mass units, protons, neutrons, electrons, isotopes, mass-energy equivalence, mass defect, binding energy, and binding energy per nucleon.
- Identify nuclear interactions and reactions including radioactive decay, half-life determination, and isotope identification.
- Describe the fission process and affects from neutron leakage.
- Describe the basic characteristics of BWRs and PWRs, including fission product barriers.
- Describe the statistical nature of radioactive decay as it relates to uncertainties encountered when measuring radioactivity.
- Describe the use of the Chart of Nuclides.
- Identify the types of radioactive decay.
- Describe each type of decay using basic equations.
- Describe the processes and characteristics of gamma and x-ray interaction with matter.
- Calculate radioactive decay using exponential equations and appropriate graphs.
- Describe alpha particles, beta particles, gamma rays and neutrons with respect to mass and energy.
- Describe the process of neutron activation.
- Identify specific isotopes of concern in power reactors during operation and following shutdown.
- Describe radon decay as related to daughters and physical properties.
- Identify and use radiological quantities and their units including activity (curies and becquerels), exposure (roentgens), dose (rads and grays), and dose equivalent (rems and sieverts).
- Identify and use significant dose terms including deep dose equivalent, eye (lens) dose equivalent, shallow dose equivalent, effective dose equivalent, committed dose equivalent, committed effective dose equivalent, total effective dose equivalent, and total organ dose equivalent.
- Convert radioactivity to dose rate through simple rules of thumb and associated calculation for various source geometries.

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Training Program Description  
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- List major sources of natural background radiation including cosmic radiation, uranium and thorium decay chains, potassium 40, and radon gas (including daughter products)
- Describe the processes and characteristics of neutron interaction with matter including elastic scattering, inelastic scattering, absorption, neutron activation, and fission.
- Select the types of materials for shielding each type of radiation.
- Define buildup factor.
- Recall values of Half or Tenth Value Layer (HVL/TVL) for Cobalt-60 gamma rays for lead, steel, concrete and water.
- Describe the phenomenon of "sky shine".
- Apply quality factors for converting dose to dose equivalent.
- Describe the mechanisms of radiation interactions with cells.
- Identify cell characteristics that affect radiosensitivity.
- Define stochastic and non-stochastic effects.
- Compare and contrast between acute and chronic radiation exposure, and for each, describe the somatic effects, genetic effects, and teratogenic effects.
- Describe the purpose and basic content of 10 CFR 20, "Standards for Protection Against Radiation".
- For acute exposures, describe the dose response relationship, acute radiation syndrome, LD-50/30, and LD-50/60.
- Explain the concepts and objectives of an ALARA TEDE evaluation.
- Explain the basis for and implications of the linear zero-threshold dose-response curve.
- Explain why radiation exposure to both individuals and groups of workers should be kept ALARA.
- Explain the risk to a pregnant worker and fetus.
- Explain the purpose of radiation protection limits in regard to risk and effect minimization.
- Describe the principles of operation and characteristics of the types of dosimetry used at a plant, including the range(s) of each device, advantages of each type of device, limitations of each type of device, and radiofrequency interference.
- Describe the dosimetry used at a plant to determine doses from various types of radiation including gamma whole-body dose, gamma extremity dose, beta skin dose, neutron dose, and lens of eye dose.
- Explain the use of effective dose equivalent monitoring, including weighting factors and limitations in the process.



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- Explain actions to take in the event of abnormal situations, such as lost, damaged, alarming and off-scale high dosimetry, exposure in excess of plant administrative limits or nuclear regulatory limits, and significant differences among multiple dosimeter readings
- Define annual limit on intake, derived air concentration, weighting factors, and solubility class.
- Explain how annual limit on intake, committed dose equivalent, committed effective dose equivalent, and the target organ relate to the appropriate derived air concentration.
- Given 10 CFR 20 Appendix B, locate derived air concentration values and calculate derived air concentration hours for practical situations involving exposure of individuals to airborne radioactivity.
- Define biological half-life and effective half-life.
- Describe requirements for monitoring and reporting internal exposure.
- State the purpose of having plant administrative limits for radiation exposure.
- Explain the differences between general area dose rate and contact dose rate and how each is used in controlling exposures.
- Describe dose reduction techniques used by technicians to reduce workers' radiation exposure.
- Describe the effects from stellite being present in the reactor coolant.
- Explain the difference between loose and fixed contamination.
- Describe the reason for having lower limits for alpha contamination.
- Define cross-contamination and describe how it can result in the uncontrolled spread of contamination.
- Identify potential sources of radioactive contamination, including work operations that can generate contamination.
- Explain the characteristic difference between particulate, iodine, tritium, and noble gases and how they affect the method of detecting and controlling airborne radioactivity.
- Explain the purpose of using radiation work permits (RWPs), the typical requirements for their use, the difference between general and job-specific RWPs and when each of them is used.
- Identify the information that should be included on RWPs.
- Explain the purpose of having each worker read and log in on the RWP and the administrative process of logging in on an RWP.
- Describe the purpose and use of single and multiple step-off pads in controlling the spread of contamination.
- Describe techniques used to prevent the spread of contamination when bringing contaminated materials out of posted areas.

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- Identify the isotopes of primary concern for airborne radioactivity at a plant.
- Relate major isotopes expected to be present in the event of fuel damage and the types of surveys used to assess their radiological hazards.
- Identify and explain the techniques for reducing the volume of radioactive solid waste generated.
- Describe system components and configurations that can result in the accumulation of radioactivity.

**2.2 STE RP2.01 – Operate Portable Radiological Survey Instruments**

2.2.1 This CIRP Task enables a trainee to perform the following activities per NISP-RP-001, *Portable Survey Instruments*:

- Perform Pre-Use Instrument Inspections and Checks
- Operate an Ion Chamber Instrument
- Operate a GM Survey Instrument
- Operate a Count Rate Meter with a GM Frisker Probe
- Operate a Count Rate Meter with an Alpha, Beta, or Dual Scintillation Probe
- Operate a Neutron Rem-Meter

2.2.2 Learning objectives and topics based on ACAD 93-008 include:

- Determine the calibration status of instruments.
- Basic theory of operation and operating characteristics of GM detectors, scintillation detectors, proportional counters, ion chambers, and neutron survey instruments.
- Instrument efficiency, the factors that affect instrument efficiency, and calculation of instrument efficiency.
- Effects of background radiation.
- Explain the differences in operating characteristics of a radiation field survey instrument and a radioactive contamination survey instrument.
- Describe the method and purpose of performing battery checks, adjusting scales to zero, source checks, response checks, and background measurements.
- Describe conditions that might affect survey instrument response including geotropism, atmospheric pressure, high humidity, mixed radiation fields, radioactive noble gas atmospheres, extreme temperatures, off-scale reading, radiofrequency interference, care and maintenance.
- Convert meter indications of contamination detection equipment to contamination levels in standard units.

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- Select the appropriate instrument for performance of radiation surveys under various conditions including expected radiation type(s), expected dose rate, and environmental conditions.
- Identify the instruments typically used to perform contamination surveys including Geiger-Mueller detectors, and alpha scintillation detectors.
- Perform and describe the operational checks performed on counting equipment including source checks, response checks, and background measurements.
- Explain the effect of background radiation on the ability to detect low levels of contamination.

**2.3 STE RP2.02 – Perform Radiation and Contamination Surveys**

2.3.1 This CIRP Task enables a trainee to perform the following activities per NISP-RP-002, *Radiation and Contamination Surveys*:

- Survey Dose Rates in an Area
- Directly Frisk a Surface
- Perform a Smear Survey
- Perform a Large Area Smear Survey
- Survey for Discrete Radioactive Particles
- Analyze Smears
- Respond to Abnormal Survey Results
- Document a Radiological Survey

2.3.2 Learning objectives and topics based on ACAD 93-008 include:

- Define "general area" and "contact" dose rates and identify each on survey maps.
- Specify the background limits for using contamination survey instruments.
- Identify unusual conditions that might affect counting equipment response including high humidity, abnormal background, electronic noise, or extreme temperature.
- Explain the operating characteristics of counting equipment.
- Explain the principles of operation and operating characteristics of area radiation monitors.
- Describe the precautions and survey techniques for entering an area in which radiation levels are unknown.

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- Explain actions that should be taken if surveys show radiological conditions significantly different from those expected, such as high contact dose rates, high general area dose rates, unexpected low dose rates, high beta dose rates, high contamination levels, high airborne radioactivity, unexpected lack of airborne radioactivity, unexpected alpha contamination, and unexpected radiological conditions resulting in posting changes.
- Describe how to estimate beta and gamma dose rates from contamination on floor, airborne radioactivity (for example, particulate, iodine, noble gas or tritium), and pipes or tanks containing radioactive liquids.
- Select the appropriate instrument for a survey and demonstrate proficiency in using it.
- Discuss actions taken if radiation levels are off-scale.
- Explain how to obtain and record dose rates from mixed radiation fields
- Demonstrate proper techniques for surveying an item for contamination using a hand-held frisker.
- Demonstrate actions to estimate contamination levels when contamination survey instruments are off-scale.
- Describe requirements for documentation of radiological surveys, including the use of survey maps, reviewing completed surveys, retaining records, and updating area maps and postings.
- Demonstrate how to use planchets and minimize contamination of counting equipment.
- Perform a radiation survey and describe procedures for the performance of routine radiation surveys, including frequency of surveys, instruments to be used, areas to be surveyed, survey techniques, and documentation of results.
- Describe the different levels of alpha contamination, including the associated controls with each level, associated dose contribution of each level, and beta, gamma and alpha ratios.
- Perform an area contamination survey, and describe procedures for performing routine area contamination surveys, including frequency of surveys, instruments to be used, areas to be surveyed, survey techniques, and documentation of results.
- Describe procedures and limitations for performing special contamination surveys, including radioactive particles on personnel or equipment, radioactive particles in area, and alpha contamination.

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**2.4 STE RP2.03 – Collect and Evaluate Radiological Air Samples**

2.4.1 This CIRP Task enables a trainee to perform the following activities per NISP-RP-003, *Radiological Air Sampling*:

- Determine the Need for an Air Sample
- Collect a Particulate and Iodine Air Sample
- Collect a Noble Gas Sample
- Operate a Continuous Air Monitor (CAM)
- Set Up and Operate a Personal Air Sampler
- Analyze a Particulate Air Sample Filter

2.4.2 Learning objectives and topics based on ACAD 93-008 include:

- Identify factors that affect the statistical accuracy of radioactivity measurements including count rate, background, count time, equipment efficiency, sample volume, sample geometry.
- Explain how the statistical accuracy of measurements can be improved.
- Define lower limit of detection (LLD).
- Explain the principles of operation and operating characteristics of continuous air monitors, iodine air monitors, particulate air monitors, and noble gas air monitors.
- Explain the principles of operation and the applications for low volume, high volume and personal air samplers.
- Identify the types of sampling equipment used for particulates, tritium, noble gas, and iodine.
- Identify the types of beakers used for air sampling, e.g. Marinelli, and explain their use.
- Demonstrate the application of sample collection equipment used for particulates, iodine, and noble gas.
- Demonstrate how to quantify the radioactivity collected on a sample and differentiate the type of nuclides that are present.
- Demonstrate the conversion of units to relate airborne concentrations in standard units and derived air concentrations.
- Demonstrate operation of low-volume samplers, high-volume air samplers, and personal air samplers.
- Collect airborne samples, and describe procedures for collecting routine airborne radioactivity samples, including frequency of surveys, types of surveys performed (particulate, iodine, noble gas, tritium), instruments to be used, areas to be sampled, sampling techniques, and documentation of results.

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- Describe the procedure for determining the derived air concentration, derived air concentration hours, and annual limit on intake for a worker in an airborne radioactivity area.
- Explain the difference between low-volume, high-volume and personal air samples, including when each is used.
- Discuss the purpose of using a continuous air monitor and identify situations in which continuous air monitors should be used.
- Identify work situations and work practices that could produce airborne radioactivity, such as leaks from contaminated systems, opening a contaminated system, working in highly contaminated areas, grinding, cutting or welding radioactive or contaminated materials.
- Discuss procedures for conducting in-progress airborne radioactivity samples, including when samples should be taken, proper placement of air sampling equipment, the definition of "breathing zone" and determining the appropriate breathing zone for various work situations, method of sampling (for example, low-volume, high-volume, personal or continuous air monitor), type of sampling (for example, particulate, iodine, noble gas or tritium), and documentation of results.

**2.5 STE RP2.04 – Post Low Level Radiological Hazards**

2.5.1 This CIRP Task enables a trainee to perform the following activities per NISP-RP-004, *Radiological Posting and Labeling*:

- Post External Radiation Hazards (excluding High Radiation Areas, Locked High Radiation Areas and Very High Radiation Areas)
- Post Areas with Smearable Contamination
- Post Airborne Radioactivity Areas
- Label Tools, Equipment, and Containers of Radioactive Material

2.5.2 Learning objectives and topics based on ACAD 93-008 include:

- Define and state the posting requirements for a radiologically controlled area, radiation area, high-radiation area, locked high-radiation area, very-high-radiation area, hot spots, and radioactive materials area.
- Describe the posting procedures for posting areas as airborne radioactivity areas.
- Identify the packaging, marking and labeling requirements for radioactive materials stored on site.
- State the posting requirements for contamination areas, high-contamination areas, alpha contamination levels, and discrete radioactive particles.

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- Describe procedures for packaging, labeling and marking radioactively contaminated materials.
- Describe the approval and posting requirements for radioactive material areas and radioactive material storage areas.

**2.6 STE RP2.05 – Control Access to High Radiation Areas**

2.6.1 This CIRP Task enables a trainee to perform the following activities per NISP-RP-005, *Access Controls for High Radiation Areas*:

- Brief for an HRA Entry
- Control Area Configurations

2.6.2 Learning objectives and topics based on ACAD 93-008 include:

- Describe the access controls required for entry into each level of radiologically controlled area (as applicable) including RWP requirements, dosimetry, notification to Radiological Protection Department, instrument or alarming dosimeter, locked barriers, warning signs and lights, and key controls.
- Discuss the conduct of prejob briefings for radiological work, including when briefings are required, frequency of briefings for continuing jobs, personnel required to attend briefings, items to be discussed in briefings, and importance of resolving all questions in briefings.

**2.7 STE RP2.06 – Monitor Personnel Contamination**

2.7.1 This CIRP Task enables a trainee to perform the following activities per NISP-RP-006, *Personnel Contamination Monitoring*:

- Respond to a Contamination Monitor Alarm
- Determine the Contamination Hazard

2.7.2 Learning objectives and topics based on ACAD 93-008 include:

- Describe the principles of operation and operating characteristics of personnel whole-body contamination monitors, hand and foot monitors, and portal monitors.
- Describe requirements for monitoring personnel for radioactive contamination when exiting contaminated areas, when exiting alpha contamination areas, when exiting discrete radioactive particle areas, when exiting the radiologically controlled areas, and when exiting a plant.
- Identify personnel who should be notified of personnel contaminations.

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- Describe procedures for handling personnel shoe or clothing contamination, including documentation required, decontamination methods, and disposition of articles that cannot be decontaminated.
- Describe the procedure to be followed when an individual is contaminated, including restricting performance of follow-up contamination surveys (whole-body) to radiological protection personnel, recording contamination levels, location, date and time on the personnel contamination report, directing decontamination of areas above limits, identifying when nasal smears and/or a whole-body count are required, documenting final results of decontamination, and interviewing individual to identify source of contamination.
- Select the appropriate personnel decontamination techniques for various levels of contamination and the degree to which contamination is fixed such as removing particles with tape, washing with lukewarm water and mild detergent, scrubbing gently with soft brush, shaving contaminated hair, sweating, and chemical decontamination
- Explain why the following are not used for personnel decontamination: hot water, cold water, and abrasive cleaners.
- Identify conditions in which skin dose calculations should be performed as a result of skin contamination.
- Identify situations in which personnel decontamination should be referred to other appropriate personnel such as contaminated wounds, contaminated eyes, ears, nose or throat, and contamination that cannot be removed using approved techniques.
- Describe special procedures for decontamination of radioiodines.
- Discuss additional actions or notifications required if an injured person is contaminated.
- State the limit (alarm setpoint) for radioactive contamination on personnel.

2.7.3 Applicable topics from ACAD 93-008 are included in STE RP2.01 and STE RP2.02.

**2.8 STE RP2.07 – Control Radioactive Material Within an RCA**

2.8.1 This CIRP Task enables a trainee to perform the following activities per NISP-RP-007, *Control of Radioactive Material*:

- Release of Personal Items
- Storage of Radioactive Material
- Movement of Radioactive Material



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2.8.2 Learning objectives and topics based on ACAD 93-008 include:

- Describe the principles of operation and operating characteristics of tool monitors.
- State the limits for radioactive contamination for release of materials, equipment, and areas for unrestricted use.
- Describe requirements for monitoring tools and equipment for radioactive contamination for release from the radiologically controlled area, for unrestricted use in the radiologically controlled area, for storage or reuse within the radiologically controlled area, and for release from a plant.
- Discuss procedures for disposal of materials used in the decontamination process, such as rags, cloths or oil-impregnated wipes, detergent solutions, and chemicals.
- Describe the methods used for decontamination of areas within a plant, such as mopping, using oil-impregnated wipes, wiping with damp rags, vacuuming, and scrubbing with brushes.
- Discuss requirements for conducting and documenting post-decontamination surveys.
- Identify special precautions associated with the disposal of materials used in decontamination, such as wet mop heads, liquids containing detergents, vacuum cleaner dust, mixed waste, discrete radioactive particles, and alpha contamination.
- Identify NRC-licensed radioactive materials requiring special controls, and discuss the controls required.
- Describe procedures for storage and retrieval of radioactive materials.
- Identify special precautions and restrictions for storage of radioactive materials outdoors.
- Discuss procedures for preventing the loss of radioactive materials.
- Describe plant requirements for monitoring decontaminated equipment prior to release.
- Discuss procedures for disposal of materials that cannot be decontaminated successfully.

**2.9 STE RP2.08 – Control HEPA Vacuums and Ventilation Equipment**

2.9.1 This CIRP Task enables a trainee to perform the following activities per NISP-RP-008, *Use and Control of HEPA Filtration and Vacuum Equipment*:

- Selection of HEPA Equipment
- HEPA Setup
- Monitoring of HEPA Operation

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- Storage of HEPA Equipment

2.9.2 ACAD 93-008 does not have topics applicable to NISP-RP-008. The EPRI STE task analysis identifies knowledge and skills required to implement the process steps listed above.

**2.10 STE RP2.10 – Perform Low Risk Radiological Job Coverage**

2.10.1 This CIRP Task enables a trainee to perform the following activities per NISP-RP-010, *Radiological Job Coverage* for activities with low radiological risk:

- Prepare for Job Coverage
- Survey Work Areas
- Monitor and Verify Protective Measures
- Respond to Unexpected Conditions
- Exercise Stop Work Authority

2.10.2 Learning objectives and topics based on ACAD 93-008 include:

- Explain the requirements for the use of multiple whole-body dosimetry, including conditions under which multiple badging is required, proper placement of dosimetry, administrative procedures for issuing and collecting multiple dosimeters, and the method of determining whole-body dose of record.
- Explain requirements for the use of extremity dosimetry, including conditions under which extremity dosimetry is required, administrative procedures for issuing and collecting extremity dosimetry, and the type(s) of extremity dosimeters.
- Describe the techniques for controlling individual exposures while performing radiological work, such as the use of pocket ion chambers or alarming dosimeters to allow workers to monitor dose received, assignment of stay times, radiation work permits (RWPs), RPT job coverage (local or video monitor), use of low-dose waiting areas, and remote electronic dosimeters.
- Describe procedures for controlling exposure to beta radiation.
- Identify techniques for controlling workers' exposure to beta radiation, such as protective clothing, face shield, and glasses.
- Explain how exposure goals can be used to reduce individual and collective exposures for specific radiological jobs, work groups, and the plant.
- Describe the method for estimating and assigning neutron dose using gamma to neutron ratios.

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- Explain the ALARA concept and how it is applied to the performance of radiological work.
- Explain the action levels and corresponding dose-reduction steps taken based on estimated cumulative dose.
- Describe the concept of "total risk" as applied to the prescription of radiological work controls.
- Describe requirements for performing total effective dose equivalent ALARA evaluations.
- Describe work time reduction techniques that can be used to reduce workers' radiation exposure, such as prejob planning and preparation, prejob mock-up training for worker familiarity, review of procedures for workability and efficiency, use of special tools to improve worker efficiency, improvement of worker comfort by controlling environment (temperature, lighting, humidity, space), prefabrication of equipment in low-dose or no-dose areas, and decontamination to reduce protective clothing requirements.
- Describe the techniques by which increased distance can be used to reduce workers' radiation exposure, such as positioning workers away from hot spots or high-dose areas, use of remote operators or special tools to increase workers' distance from a source, and removing equipment to low-dose areas for maintenance.
- Describe the consequences of removing permanent or temporary shielding without proper review and authorization.
- Describe administrative procedures for the control of permanent and temporary shielding.
- Discuss factors that determine the ultimate effectiveness of installing permanent or temporary shielding, such as the cost of installation (dollars and man-rem) versus benefit(s) of installation, physical space limitations, 10 CFR 50.59 review constraints, floor loading constraints, pipe and pipe hanger load constraints, and engineering evaluations.
- Evaluate the effectiveness of temporary shielding in various practical applications.
- Describe the proper use of body shield vests to reduce worker exposure, including the importance of the need to brief workers on proper use of the vests, prior to performing work, ensuring the vest is adequately shielding the body compartments requiring protection, and employing methods to track and record worker use.

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- Describe techniques for controlling the spread of contamination to personnel and equipment, including protective clothing, packaging of contaminated materials, use of containment devices, control of leaks from radioactive systems, and decontamination.
- Describe the devices used for containment of contamination during radiological work, such as drapes, glove bags, tents, drain bottles, berms or absorbents to contain liquid, and catch containments.
- Identify the conditions in which the use of each type of containment device should be considered.
- Describe techniques to minimize the spread of contamination when using containment devices, including containment inspection and maintenance, proper drainage, air filtration, protective clothing requirements, precautions during use, removal of contaminated equipment, and post job removal or decontamination of the containment device.
- Identify methods by which a work site can be prepared in advance for the performance of highly contaminated work, such as work area covered and/or skirted with disposable material, work area covered and/or skirted with launderable, reusable sheeting, work area covered with strippable paint, concrete surfaces painted for ease in decontamination, and use of filtered vacuums and ventilation.
- Describe controls that can be used to reduce exposure to airborne radioactivity, such as using filtered ventilation, decontaminating areas or equipment to eliminate the source of airborne radioactivity, using containment devices (tents, glove bags), repairing leaks in contaminated systems, performing work under water or keeping contaminated materials wet, using encapsulation coatings and materials, and using respiratory protection.
- Discuss procedures for tracking exposure to airborne radioactivity, including levels at which tracking is required and sampling requirements.
- Discuss requirements for entering and working in airborne radioactivity areas, such as the radiation work permit, respiratory protection equipment, and notification of Radiological Protection Department.
- Describe the methods that can be used to invoke radiological protection requirements including knowledge procedure steps, radiation work permit, verbal instructions from the supervisor, verbal instructions from radiological protection personnel.

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- Explain the responsibilities the following personnel regarding specifying, complying with, monitoring, and enforcing radiological protection and ALARA requirements: workers, workers' supervisors, RPTs, and RP supervisors.
- Demonstrate actions that should be taken if radiological conditions at the job site are significantly different from those shown on the RWP or discussed in the prejob briefing.
- Identify areas in a plant that require specific manager approval for entry due to extreme radiological conditions.
- Explain actions to be taken if the work scope or work location changes from that listed on the RWP or discussed in the prejob briefing.
- Explain why RPTs have stop-work authority and identify the types of situations in which this authority should be implemented.
- Discuss actions needed to recover from a stop-work condition.
- Identify and explain the factors that determine the need for and type of protective clothing to be used during radiological work, such as the level of contamination, position of the worker(s), presence of airborne radioactivity, presence of liquid, type of work being performed, environmental conditions, and "total risk" concept.
- Describe special precautions that should be used, when practical, to control or reduce exposures under certain radiological conditions, such as assigning stay times and time keepers, performing continuous RPT coverage, assigning alarming dosimeters or dose rate meters, providing temporary shielding, specifying low-dose-rate waiting area, removing high-dose-rate sources, using electronic communications and remote monitoring telemetry.
- Describe precautions that should be used when practical to control the spread of radioactive contamination during radiological work, such as the use of containment devices, requirements for special protective clothing, and job site preparation with disposable coverings.
- Describe precautions that should be used, when practical, to control airborne radioactivity, such as special ventilation, containment device, decontamination of the work area, and performing work under water or wetting contaminated work surfaces.
- Evaluate the use of temporary shielding for specific job applications.

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- Discuss the conditions under which each of the following should be invoked during radiological work: continuous RPT coverage, intermittent RPT coverage, RPT present at start of job, advanced radiation worker coverage, remote RPT coverage, and no RPT coverage.
- Describe the radiological surveys that should be performed under various radiological conditions when work is in progress, including radiation surveys, contamination surveys, airborne radioactivity surveys, and locked high-radiation area surveys.
- Identify locations that should be included in radiation surveys when work is in progress, such as the component being worked on, nearby piping and components, location where workers are positioned, the path to and from the work site, low-dose areas, hot spots, and potential transient dose rate areas (for example, resin lines, drain lines, movement of sources).
- Discuss plant access control procedures for entry into the following for performance of work: radiologically controlled area, radiologically controlled area, restricted area, radiation area, high-radiation area, locked high-radiation area, very-high-radiation area, contaminated area, airborne radioactivity area, and neutron radiation area.
- Describe actions required when leaving a work site upon completion of radiological work, such as follows: packaging, marking, and transferring contaminated tools, equipment, and trash, removing protective clothing, monitoring for contamination, returning special dosimetry, logging out of RWP, and notifying radiological protection personnel of job completion.
- Demonstrate the interpersonal skills and human relations skills used to perform job coverage and challenge poor radworker practices effectively in conditions such as the main control point, satellite control point, job coverage during worker performance problems, and exit point control.
- Identify work practices, instrument responses or alarms indicating the potential for a radiological incident.
- Describe, in general terms, the expected response to radiological incidents, including the precedence given to treating injuries, mitigating and minimizing exposure to plant personnel and the public, mitigating and minimizing damage to equipment, and notifying appropriate personnel.

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- Discuss the role of various plant personnel in responding to radiological incidents, including the following: personnel directly involved in the incident and immediately affected by it (regardless of work group), other personnel nearby but not affected, control room personnel, RPTs, radiological protection supervisors, fire brigade, auxiliary operators, and plant managers.
- Identify the radiological consequence that may result from various incidents, such as a sudden increase in dose rates, uncontrolled spread of contamination, leak or spill of contaminated liquid, injury to an individual while performing radiological work, fire in the radiologically controlled area, loss of a high-activity radiation source, degraded core, and uncontrolled or unsecured high-radiation areas.
- Identify the immediate actions to be taken to control and minimize the extent of radiological incidents such as an area radiation monitor alarm, off-scale pocket ion chamber, alarm on electronic dosimeter, continuous air monitor alarm, spill of contaminated liquid or resin, spill of dry contaminated material, contaminated personnel, contaminated injured personnel, fire in the radiologically controlled area, and unmonitored release of radioactivity to the environment.
- Identify the protective clothing requirements for area decontamination.
- Explain why area decontamination should begin at the areas of lowest contamination levels and progress toward areas of high levels.
- Describe procedures for controlling discrete radioactive particles.

### **3.0 Senior Technician Training Program**

The Senior Technician Training Program is used to qualify technicians to perform senior level CIRP tasks that require experience as specified by each licensee's regulatory commitment to either ANSI 18.1 or ANSI 3.1. Senior level CIRP Task qualifications in PADS are based on ANSI 18.1. Licensees are expected to communicate and control task qualifications through their site programs based on their specific commitment to either ANSI 18.1 or ANSI 3.1.

Junior technicians may complete EPRI STEs for senior level CIRP Task qualifications prior to meeting ANSI 18.1 experience requirements. However, PADS shall not be updated with senior level CIRP Task qualifications until ANSI 18.1 experience requirements are met. STEs completed prior to meeting ANSI 18.1 requirements will be entered in the EPRI STE Registry and tracked for later entry into PADS.

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**3.1 RP Theory Fundamentals for Senior Task Qualifications**

This fundamentals course provides a trainee with the common background knowledge essential for completing the senior level STEs. Learning objectives and topics based on ACAD 93-008 include:

- Authority and responsibilities of the NRC.
- Purpose and significance of site technical specifications.
- List major systems and locations in a plant contributing to worker exposures to gamma and neutron radiation.
- Identify plant systems contributing to the radiological source term of a plant and:
  - State the purpose of each system.
  - Identify major components and equipment contributing to the radiological source term.
  - Identify conditions that preclude safe work near system components.
  - Describe the radiological precautions associated with maintenance tasks.
- Discuss the normal uses, locations, advantages, disadvantages, and relative sensitivity of a portable frisker, whole-body contamination monitor, portal monitor, bag counters, tool monitors, and conveyor type contamination monitors.

**3.2 STE RP3.04 – Post a High Radiation Area, or Locked High Radiation Area**

3.2.1 This CIRP Task enables a trainee to perform the following activities per NISP-RP-004, *Radiological Posting and Labeling*:

- Post High Radiation Areas, Locked High Radiation Areas and Very High Radiation Areas.

3.2.2 Applicable learning objectives and topics based on ACAD 93-008 are included in STE RP2.04.

**3.3 STE RP3.05 – Control Access to Locked High Radiation Areas**

3.3.1 This CIRP Task enables a trainee to perform the following activities per NISP-RP-005, *Access Controls for High Radiation Areas*:

- Brief for an LHRA Entry
- Issue a Key to Access an LHRA
- Transfer Possession of an Issued LHRA Key
- Terminate Access into an LHRA and Return the Key

3.3.2 Applicable learning objectives and topics based on ACAD 93-008 are included in STE RP2.05.



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**3.4 STE RP3.06 – Unconditionally Release Personnel Following Valid Personnel Contamination Monitor Alarms**

3.4.1 This CIRP Task enables a trainee to perform the following activities per NISP-RP-006, *Personnel Contamination Monitoring*:

- Personnel Decontamination
- Dose Assessment and Documentation
- Evaluate Personnel for Unconditional Release following Personnel Contamination

3.4.2 Applicable learning objectives and topics based on ACAD 93-008 are included in STE RP2.06.

**3.5 STE RP3.07 – Unconditionally Release Materials from an RCA**

3.5.1 This CIRP Task enables a trainee to perform the following activities per NISP-RP-007, *Control of Radioactive Material*:

- Release of Non-Personal Items
- Release of Liquids
- Release of Bulk or Aggregate Materials
- Control of Radioactive Material Temporarily Released

3.5.2 Applicable learning objectives and topics based on ACAD 93-008 are included in STE RP2.07.

**3.6 STE RP3.09 – Provide Job Coverage for Radiography**

3.6.1 CIRP Task RP3.10 is a prerequisite for completing this CIRP Task. This CIRP Task enables a trainee to perform the following activities per NISP-RP-009, *Radiography*:

- Survey and Store a Radiography Source
- Review the Radiography Shot Plan
- Prepare for the Radiography Shot
- Monitor the Radiography Shot
- Restore Area
- Emergency Response Actions

3.6.2 Applicable learning objectives and topics based on ACAD 93-008 are included in RP2.10 and RP3.10.

**3.7 STE RP3.10 – Perform Medium and High Risk Radiological Job Coverage**

3.7.1 This CIRP Task enables a trainee to perform the following activities per NISP-RP-010, *Radiological Job Coverage*:

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- Perform Job Coverage for Activities with Medium or High Radiological Risk
- Track Stay Time

3.7.2 Applicable learning objectives and topics based on ACAD 93-008 include:

- Identify the prejob radiological survey requirements for the work operation to be performed. Based on the results of the prejob surveys and the scope of work, identify or evaluate the need for a formal ALARA review, prejob briefings with workers, type and location of whole-body dosimeters, multiple whole-body dosimeters, extremity dosimeters, protective clothing requirements, respiratory protection requirements, special precautions or conditions to minimize the spread of contamination, reduce exposure, or minimize airborne contamination, degree of RPTs' on-the-job coverage, in-process radiological surveys to be performed, radiological hold points, and electronic, secondary dosimeter setpoints.
- Describe how the results of ALARA reviews are implemented, including documentation required, mandatory versus suggested techniques, technician and worker authority and procedure for modifying requirements, and responsibility for implementation.
- Explain how the type and location of whole-body dosimetry are determined based on body position and dose rate gradient.
- Identify the criteria used to determine the need for multiple badging or for extremity monitoring.
- Identify measures to take when protective clothing is used in conditions that could result in heat stress.
- Identify and explain the factors that determine the need for and type of respiratory protection equipment to be used during radiological work, such as the levels of airborne radioactivity, type of airborne radioactivity (particulate versus gas), levels of contamination in the work area, whether work area is wet or dry, assigned protection factor of the respiratory protection equipment, duration of the job, type of work being performed (for example, welding, grinding, cutting), impact of decreased worker efficiency due to respirator use resulting in increased whole-body dose, applicability of portable ventilation in lieu of respirator use, and alpha classification.

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- Discuss proper job coverage and radiological protection measures for high-exposure jobs and potential high-exposure jobs, such as steam generator maintenance (PWR), reactor coolant pump seal replacement (PWR), reactor water cleanup pump maintenance (BWR), recirculation pump seal replacement (BWR), control rod drive rebuild (BWR), diving operations, spent resin transfer operations, spent fuel movements, in-core detector maintenance, and work in or around spent fuel pool.

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**JUNIOR QUALIFICATIONS**

- RPFUN1 RP Theory Fundamentals for Junior Task Qualifications<sup>1</sup>
- RP2.01 Operate Portable Radiological Survey Instruments
- RP2.02 Perform Radiation and Contamination Surveys
- RP2.03 Collect and Evaluate Radiological Air Samples
- RP2.04 Post Low Level Radiological Hazards
- RP2.05 Control Access to High Radiation Areas
- RP2.06 Monitor Personnel Contamination
- RP2.07 Control Radioactive Material Within an RCA
- RP2.08 Control HEPA Vacuums and Ventilation Equipment
- RP2.10 Perform Low Risk Radiological Job Coverage
- RPCONT Continuing Training for Supplemental RP Technicians<sup>2</sup>
- JRTECH Prerequisites for Junior Technician Position Qualification Complete

**SENIOR QUALIFICATIONS**

- RPFUN2 RP Theory Fundamentals for Senior Task Qualifications<sup>1</sup>
- RP3.04 Post a High Radiation Area or Locked High Radiation Area
  - Expires if RPCONT not completed in previous or current calendar year
- RP3.05 Control Access into Locked High Radiation Areas
  - Expires if RPCONT not completed in previous or current calendar year
- RP3.06 Unconditionally Release Personnel Following Valid Contamination Monitor Alarms
  - Expires if RPCONT not completed in previous or current calendar year
- RP3.07 Unconditionally Release Materials from an RCA
  - Expires if RPCONT not completed in previous or current calendar year
- RP3.09 Provide Job Coverage for Radiography

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<sup>1</sup> Refer to section 6.4.1.

<sup>2</sup> This code is used to track when the annual continuing training requirement becomes applicable. AN18.1 or AN3.1 codes in a technician's training history negate the need to enter this code.

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- Expires if RPCONT not completed in previous or current calendar year
- RP3.10 Provide Medium and High Risk Radiological Job Coverage
  - Expires if RPCONT not completed in previous or current calendar year
- AN18.1 ANSI 18.1 Experience
- AN3.1 ANSI 3.1 Experience
- RPCONT Continuing Training for Supplemental RP Technicians<sup>2</sup>

<sup>1</sup>Refer to section 6.4.1.

<sup>2</sup>This code is used to track when the annual continuing training requirement becomes applicable. AN18.1 or AN3.1 codes in a technician's training history negate the need to enter this code.

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<b>CIRP Task #</b>	<b>CIRP Task Title</b>	<b>Equivalent NEI RPT Skills</b>
RP2.01	Operate Portable Radiological Survey Instruments	<b>RPT001</b> – Operation of Survey Instruments (Ion Chambers, Geiger-Mueller, Extendable Probe Instruments, and Count Rate Meters (Friskers))
RP2.02	Perform Radiation and Contamination Surveys	<b>RPT001</b> – Operation of Survey Instruments (Ion Chambers, Geiger-Mueller, Extendable Probe Instruments, and Count Rate Meters (Friskers)) <b>RPT002</b> – Perform Radiation and Contamination Surveys
RP2.03	Collect and Evaluate Radiological Air Samples	<b>RPT001</b> – Operation of Survey Instruments (Ion Chambers, Geiger-Mueller, Extendable Probe Instruments, and Count Rate Meters (Friskers)) <b>RPT003</b> – Perform Airborne Radioactivity Survey <b>RPT005</b> – Radiological Posting/Deposting <b>RPT006</b> – Respond to Radiological Alarms (e.g. CAM, ARM, PCM, and Dosimetry) <b>RPT007</b> – Operate Continuous Air Monitors (CAMs)
RP2.04	Post Low Level Radiological Hazards	<b>RPT002</b> – Perform Radiation and Contamination Surveys <b>RPT005</b> – Radiological Posting/Deposting
RP2.05	Control Access to High Radiation Areas	<b>RPT008</b> – Provide Radiological Job Coverage <b>RPT013</b> – Monitor and Coach Workers in the RCA Including Their Ingress and Egress

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<b>CIRP Task #</b>	<b>CIRP Task Title</b>	<b>Equivalent NEI RPT Skills</b>
RP2.06	Monitor Personnel Contamination	<p><b>RPT001</b> – Operation of Survey Instruments (Ion Chambers, Geiger-Mueller, Extendable Probe Instruments, and Count Rate Meters (Friskers))</p> <p><b>RPT002</b> – Perform Radiation and Contamination Surveys</p> <p><b>RPT006</b> – Respond to Radiological Alarms (e.g. CAM, ARM, PCM, and Dosimetry)</p>
RP2.07	Control Radioactive Material Within an RCA	<p><b>RPT001</b> – Operation of Survey Instruments (Ion Chambers, Geiger-Mueller, Extendable Probe Instruments, and Count Rate Meters (Friskers))</p> <p><b>RPT002</b> – Perform Radiation and Contamination Surveys</p> <p><b>RPT004</b> – Radioactive Material Movement and Storage on Owner-Controlled Property (Does not include 49 CFR shipping criteria)</p> <p><b>RPT005</b> – Radiological Posting/Deposting</p>
RP2.08	Control HEPA Vacuums and Ventilation Equipment	<p><b>RPT001</b> – Operation of Survey Instruments (Ion Chambers, Geiger-Mueller, Extendable Probe Instruments, and Count Rate Meters (Friskers))</p> <p><b>RPT002</b> – Perform Radiation and Contamination Surveys</p> <p><b>RPT003</b> – Perform Airborne Radioactivity Survey</p> <p><b>RPT005</b> – Radiological Posting/Deposting</p> <p><b>RPT014</b> – Operation of HEPA Vacuum and/or Ventilation Equipment</p>

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RP2.10	Perform Low Risk Radiological Job Coverage	<p><b>RPT001</b> – Operation of Survey Instruments (Ion Chambers, Geiger-Mueller, Extendable Probe Instruments, and Count Rate Meters (Friskers))</p> <p><b>RPT002</b> – Perform Radiation and Contamination Surveys</p> <p><b>RPT003</b> – Perform Airborne Radioactivity Survey</p> <p><b>RPT006</b> – Respond to Radiological Alarms (e.g. CAM, ARM, PCM, and Dosimetry)</p> <p><b>RPT008</b> – Provide Radiological Job Coverage</p> <p><b>RPT010</b> – Direct/Perform Area and Equipment Decontamination</p> <p><b>RPT013</b> – Monitor and Coach Workers in the RCA Including Their Ingress and Egress</p>
RP3.04	Post a High Radiation Area, Locked High Radiation Area	<p><b>RPT002</b> – Perform Radiation and Contamination Surveys</p> <p><b>RPT005</b> – Radiological Posting/Deposting</p>
RP3.05	Control Access to Locked High Radiation Areas	<p><b>RPT001</b> – Operation of Survey Instruments (Ion Chambers, Geiger-Mueller, Extendable Probe Instruments, and Count Rate Meters (Friskers))</p> <p><b>RPT002</b> – Perform Radiation and Contamination Surveys</p> <p><b>RPT008</b> – Provide Radiological Job Coverage</p> <p><b>RPT009</b> – Provide High Risk Radiological Job Coverage</p>



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RP3.06	Unconditionally Release Personnel Following Valid Contamination Monitor Alarms	<p><b>RPT001</b> – Operation of Survey Instruments (Ion Chambers, Geiger-Mueller, Extendable Probe Instruments, and Count Rate Meters (Friskers))</p> <p><b>RPT002</b> – Perform Radiation and Contamination Surveys</p> <p><b>RPT006</b> – Respond to Radiological Alarms (e.g. CAM, ARM, PCM, and Dosimetry)</p> <p><b>RPT012</b> – Personnel Decontamination</p>
RP3.07	Unconditionally Release Materials from an RCA	<p><b>RPT001</b> – Operation of Survey Instruments (Ion Chambers, Geiger-Mueller, Extendable Probe Instruments, and Count Rate Meters (Friskers))</p> <p><b>RPT002</b> – Perform Radiation and Contamination Surveys</p> <p><b>RPT011</b> – Survey Material for Unconditional Release</p>
RP3.09	Provide Job Coverage for Radiography	<p><b>RPT001</b> – Operation of Survey Instruments (Ion Chambers, Geiger-Mueller, Extendable Probe Instruments, and Count Rate Meters (Friskers))</p> <p><b>RPT002</b> – Perform Radiation and Contamination Surveys</p> <p><b>RPT003</b> – Perform Airborne Radioactivity Survey</p> <p><b>RPT006</b> – Respond to Radiological Alarms (e.g. CAM, ARM, PCM, and Dosimetry)</p> <p><b>RPT008</b> – Provide Radiological Job Coverage</p> <p><b>RPT009</b> – Provide High Risk Radiological Job Coverage</p> <p><b>RPT010</b> – Direct/Perform Area and Equipment Decontamination</p> <p><b>RPT013</b> – Monitor and Coach Workers in the RCA Including Their Ingress and Egress</p>

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RP3.10	Provide Medium and High Risk Radiological Job Coverage	<p><b>RPT001</b> – Operation of Survey Instruments (Ion Chambers, Geiger-Mueller, Extendable Probe Instruments, and Count Rate Meters (Friskers))</p> <p><b>RPT002</b> – Perform Radiation and Contamination Surveys</p> <p><b>RPT003</b> – Perform Airborne Radioactivity Survey</p> <p><b>RPT006</b> – Respond to Radiological Alarms (e.g. CAM, ARM, PCM, and Dosimetry)</p> <p><b>RPT008</b> – Provide Radiological Job Coverage</p> <p><b>RPT009</b> – Provide High Risk Radiological Job Coverage</p> <p><b>RPT010</b> – Direct/Perform Area and Equipment Decontamination</p> <p><b>RPT013</b> – Monitor and Coach Workers in the RCA Including Their Ingress and Egress</p>
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## Attachment 5 Credited Experience for ANSI Qualification Page 1 of 1

Technician Name (Print): \_\_\_\_\_

Last 4 Digits of Social Security Number: \_\_\_\_\_

Job/Experience Type	Max Allowable Credit (Hrs) – Note 1	Credited Experience (Hrs) – Note 2
Navy ELT (overhaul)	No Limit	
Shipyards/Tenders RadCon (NAVSEA 108 Certification)	No Limit	
Fuel Reprocessing/Plutonium Production	No Limit	
NPP Sr. or Jr. RP Technician	No Limit	
Radioactive Facility Decommissioning – Note 3	No Limit	
National Laboratory – Note 4	No Limit	
NPP RP Technician Instructor (n/a to ANSI 18.1)	2,000	
Related Technical Training and Education (n/a to ANSI 18.1)	2,000	
Navy ELT (non-overhaul) Credit for ANSI 18.1	1,000	
Navy ELT (non-overhaul) Credit for ANSI 3.1	2,000	
NPP Dosimetry Technician	1,000	
NPP Respiratory Protection Technician	1,000	
NPP Count Room Technician	1,000	
NPP Radiochemistry Technician	1,000	
NPP GET RP Instructor (n/a to ANSI 18.1)	1,000	
NPP Decon Technician (meter qualified)	1,000	
NPP Control Point Monitor	500	
NPP Laundry Monitor	500	
Miscellaneous RP Work at Other Facilities – Note 4	500	

**Total=** \_\_\_\_\_

**Note 1:** The maximum amount of experience that can be credited toward the experience requirements in ANSI 18.1 or ANSI 3.1.

**Note 2:** Record the number of hours of experience that can be credited towards ANSI experience requirements. No more-than-2000 hours per calendar year can be credited for working experience; 2000 hours of experience is equivalent to 1 year. No more than 40 hours per week can be credited for related technical training. Do not record values greater than the maximum allowable credits listed in the preceding column.

**Note 3:** Credited experience must involve responsibilities for radiological job coverage during active decommissioning, i.e. dismantling radioactive systems and components.

**Note 4:** Credited experience must involve radiation protection responsibilities for work activities and radiological conditions similar to that encountered in a nuclear power plant.

I certify the above individual has a minimum of 6 months experience providing radiological surveillance and control of activities in radiological conditions similar to that encountered in a nuclear power plant **AND** meets the requirements for:  ANSI 18.1  ANSI 3.1

Approval Print & Sign: \_\_\_\_\_

Date: \_\_\_\_\_

Attach Resume

