

# Training and Qualification of RP Technicians and Radiation Workers

ISOE Board/Bureau Meeting  
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# Training and Qualification of RP Technicians

- ▶ Radiation Protection Technicians at US power plant are trained and qualified in accordance with guidelines developed by the National Academy for Nuclear Training
- ▶ National Academy for Nuclear Training accredits all Operations, Technical (Maintenance, RP, and Chemistry), and Engineering training programs at US power plants
- ▶ ACAD 93-008, “Guideline for Training and qualification of Radiological Protection Technicians” establishes the initial and continuing training criteria for RP technicians

# Training and Qualification of RP Technicians

- ▶ ACAD 93-008 identifies the following expectations relative to RP Technician Initial Training:
  - Provide trainees with an understanding of station policy, procedures, and task performance standards
  - Develop trainees' understanding of the fundamental scientific principles that apply to radiological protection activities and operation of nuclear power plants.
  - Provide trainees with an understanding of the operating and radiological protection principles of specific equipment and components.
  - Evaluate trainees via written, oral, and practical examinations and by discussions of key knowledge, skills, and tasks needed for job performance.
  - Qualify individuals to perform their jobs correctly and in a safe, reliable, and efficient manner.

# Training and Qualification of RP Technicians

- ▶ ACAD 93-008 identifies the following expectations relative to RP Technician Continued Training:
  - Maintain high performance level of radiological protection technicians
  - Improve knowledge and skills when changes in job scope are identified
  - Increase knowledge of selected applied fundamentals presented in initial training, with emphasis in areas of demonstrated weakness
  - Maintain awareness of responsibilities for safe operation of the plant and consequences of incorrect job performance

# Training and Qualification of RP Technicians

- ▶ ACAD 93–008 identifies the following expectations relative to RP Technician Continued Training: (continued)
  - Correct performance deficiencies determined through systematic evaluation of performance
  - Maintain knowledge of procedural changes for areas in which they are qualified
  - Emphasize lessons learned from plant and industry operating experience to prevent occurrence/recurrence of errors
  - Enhance performance through timely training for infrequent, difficult, and important tasks

# RP Initial Training Processes

- ▶ **Fundamentals / Theoretical Training: Performed in a Classroom Environment**
  - Instructor Facilitated Lectures
  - Self-Study
- ▶ **Radiological Control Techniques: Conducted in Dynamic Learning Environments or in the Plant**
- ▶ **Fundamentals / Theoretical Training Syllabus Includes:**
  - Industrial Safety at the worksite
  - Administrative: RP and Station Procedures, Plant Drawings, Work Order System
  - Fundamentals: Mathematics, Physics, Electrical Science, Basic Atomic Structure, Chemistry
  - Plant Systems and Components
  - Radiation Detection Equipment / Theory of Operation
  - Radiological Protection Theory and Techniques: Radioactive Decay, Interactions with Matter, Biological Effects, External / Internal Dose Control, Contamination Control, Monitoring of radiological work
  - Specialized Skills: example, Radwaste Packaging and Shipping

# RP Initial Training Processes

- ▶ Initial Training Schedule:
  - Trainees attend training for approximately 40 hours/week
  - Duration of initial training is generally six to nine months
- ▶ Most RP training programs have two instructors that develop and deliver the lesson plans
- ▶ On the Job Training (OJT) and Task Performance Evaluations (TPE):
  - Following initial classroom training, trainees participate in OJT and TPE at the plant
  - OJT and TPE focus of qualifying RP technicians on specific tasks:
- ▶ Examples:
  - Use of radiation detection instruments
  - Personnel decontamination
  - Air sampling
  - Generating radiation work permits

# RP Initial Training Processes

- ▶ RP Programs generally have 30 to 50 tasks that trainees must demonstrate their competency prior to working independently in the field
- ▶ Senior RP technicians generally provide the OJT with the trainees in the plant
- ▶ RP supervisors conduct the TPEs to determine the trainees' level of competence .
  - If the trainee successfully demonstrates the necessary level of competency during the TPE, the trainee is designated as 'qualified' to independently perform the task
- ▶ Trainees generally require nine to twelve months to complete all necessary task qualifications

# RP Continued Training Processes

- ▶ Training to Improve Performance
- ▶ Continuing training needs are identified through ongoing training program evaluations and analyses of worker performance
- ▶ RP Department Training Committees:
  - Identify performance weaknesses
  - Determine if training is a viable method to improve performance
- ▶ RP Training Instructors develop lesson plans to address weaknesses
  - Training may be in classrooms or dynamic learning facilities.

# RP Continued Training Processes

- ▶ Continued Training also includes refresher training in RP fundamental topical areas and recent industry Operation Experience
- ▶ Refresher training may include:
  - Instrument theory / operation / calibration
  - Effective methods for conducting radiological briefings
  - Use of remote monitoring equipment
  - Biological Effects of Radiation
  - Review of new RP procedures
- ▶ Operating Experience Training:
  - Prevention of unplanned exposure
  - Inadvertently release of radioactive material from the radiological controlled area
  - Causes and Contributors associated with industry alpha and airborne contamination events
- ▶ Duration and Frequency of RP continued training:
  - Approximately 24 to 32 hours each calendar quarter

# Radworker Training Processes

## ACAD 00-007, “Guidelines for Radiation Worker Training”

- ▶ This guideline provides a framework for developing and implementing radiation worker training (RWT) and radiological respirator training (RRT).
  - Radiation working training provides the knowledge and skills necessary to work safely within a radiologically controlled area (RCA)
  - Radiological respirator training provides training for use of respiratory protection equipment to limit internal radiation dose
- ▶ ACAD 00-007 recommends Radworker Training include the following topics:
  - Sources of radiation
  - Types and measurement of radiation
  - Biological effects of radiation and risks
  - Exposure limits and guidelines
  - ALARA principles; dose and contamination control
  - Use of dosimetry
  - Radiation work permit processes and radiological postings

# Radworker Training Processes

- ▶ Radworker's must demonstrate their understanding of the training material by completing a written exam
- ▶ In addition to the classroom training and examinations; workers must demonstrate their abilities to wear protective clothing, select and follow the instruction of a radiation work permit, use effective ALARA principles, and control the spread of contamination at the jobsite
  - Usually conducted in a dynamic learning activity center that have mockups of radiological and contaminated areas
- ▶ RP supervisor and senior technicians generally provide the training and evaluations of worker competence in the dynamic learning environments
- ▶ Duration of Radworker Training (classroom and dynamic activity):
  - Eight to twelve hours

# Portable Radiation Protection Technician Quals

# Portable SRPT Quals

- ▶ Delivering the Nuclear Promise Initiative RP-12
- ▶ Eliminate Site Specific Qualifications of Supplemental Radiation Protection Technicians through Development of a Standard Vendor Training Program

# Portable SRPT Quals

- ▶ Desired end-state—
  - Prior to arrival on-site, Supplemental Radiation Protection vendors will train and qualify their technicians using industry standard task list training criteria.
- ▶ Value proposition (vision of excellence)—
  - Eliminate on average the 2 to 3 days each site historically spends to qualify the supplemental RP technicians (SRPTs)
  - Result in improved SRPT performance due to standardization of key radiation protection processes and procedures.

# Portable SRPT Quals – Deliverables

- ▶ Standardized Industry Task
- ▶ Standardized Industry Processes / Procedures for key RP practices
- ▶ Standard training and qualification completed by the Vendor at their training facilities
- ▶ Standard acceptance criteria for meeting ANSI requirements (ANSI 3.1 1978 or 2014)

# Portable SRPT Quals – Dates

- ▶ Issue the Efficiency Bulletin December 2016
- ▶ Implementation – December 2017
- ▶ Key Items
  - Final Task List – Complete (maybe)
  - Draft of the industry procedure/process – December 2016
  - Final industry processes – February 2017
  - Development of Supporting Task evaluation materials – July 2017

# Portable SRPT Quals

- ▶ Develop the following standard training materials and functions:
  - Supplemental Radiation Protection Technician Task List
  - Training materials including task qualification tools using the EPRI STE or similar process
  - Establish an industry process description for supplemental RP technician program
  - Establish the periodic industry oversight committee

# Portable SRPT Quals

- ▶ Develop the common industry Procedures and Processes for the following:
  - Postings – NISP – RP-02 (Drafted)
  - Radiological Surveys – NISP-RP-03 (Drafted)
  - Airborne Surveys – NISP – RP-04 (Drafted)
  - Alpha Surveys
  - Access Control – NISP-RP-06 (Drafted)
  - Job Coverage – NISP-RP-07 (Drafted)
  - Common Glossary –
  - Free Release Process
  - Personnel Contamination Monitoring – NISP-RP-09 (Drafted)
  - Radiography – NISP-RP-10 (Drafted)

# Portable SRPT Quals – Site Actions

- ▶ Station RPMs to revise procedures to implement the common industry procedures and processes
- ▶ Implement ANSI 3.1, 2014
- ▶ Each site to develop a specific change management plan based on the changes required at the station or utility
- ▶ Station communications to site personnel on the change

# Portable SRPT Quals – Guidelines

- ▶ A periodic review of the vendor training program will be conducted, similar to a NUPIC audit
- ▶ An industry oversight committee meeting will be conducted periodically and at least annually to review outage performance and make recommended changes to the training programs
- ▶ Station observation of SRPT performance

# Questions?

