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Efficiency Bulletin: 17-02
Self-Protection for Radiological Work Activities

Select radiation workers will be trained and qualified to perform self-protection for activities with low radiological risks to themselves or others. This initiative will allow radiological protection staffs to focus oversight on higher radiological risk activities and improve the work efficiency for self-protection workers.

Addressees:  Chief nuclear officers, NEI APCs and INPO APCs

Issue:  RP-13, Self-Protection for Radiological Work Activities

Summary of Efficiency Opportunity

- Desired end-state—Select radiation workers are trained and qualified to perform independent radiological monitoring for activities with manageable radiological risks. Qualified self-protection workers perform and document radiological surveys, establish effective radiological controls, and monitor radiological conditions during work activities. Radiological training and qualification are commensurate with assigned tasks. Self-protection workers are allowed to monitor themselves and one other worker.

Limitations:
Self-protection workers will only be allowed to monitor themselves and one coworker as providing monitoring for multiple workers can increase the risk of HU and rad worker errors. Self-protection workers are permitted to provide radiological control and assessment in work areas with the following radiological constraints:

- < 250 mrem/hr
- < 50,000 dpm/100 cm²
- Radioactive discrete particle zones less than 200,000 dpm.
Examples of tasks performed by self-protection workers:
- installing/removing clearance tags
- scaffold erection/dismantling
- transfer of tools from step-off pad to storage area
- chemistry sample collection
- insulation work
- control and removal of material from contaminated areas
- valve operation and testing
- instrumentation and control (I&C) breach of systems for instrumentation calibrations/testing.

Worker Experience:
- Workers selected for self-protection qualification shall be qualified radiation workers and have a minimum of 24 months of applicable nuclear power plant experience in areas such as operations, maintenance, engineering and chemistry.

Plant staff likely to benefit from self-protection:
- operators
- radioactive waste handlers
- decontamination technicians
- chemical technicians
- I&C technicians.

- Value proposition (vision of excellence)—Trained and qualified workers will be authorized to perform self-briefings and self-protection for select activities, improving worker efficiency while increasing radiation protection (RP) resource availability to support oversight of higher risk tasks. Self-protection initial training and qualification is a projected 120 hour (minimum) commitment with an additional eight hours projected for annual continued training.

- Why is it important?—Allowing select workers to monitor and document radiological data specific to their work activities will improve work execution efficiencies and allow RP personnel to focus resources on higher risk tasks.

- Industry benchmark value(s)—Unit collective radiation exposure performance and the number of unplanned dose, high radiation area and personnel contamination events should remain consistent with current performance.

- Measure of effectiveness:
  - Management observations of worker performance, including adherence to radiation work permit requirements, use of self-briefing cards and quality of recorded survey information.
  - No increases in the number of high radiation area events, electronic dosimeter dose and unplanned dose rate alarms, and internal dose assignments.

Key to Color Codes:
Red: NSIAC initiative - full participation required for viability
Blue: Action expected at all sites, but is not needed for broad industry viability
Green: Utility discretion to implement, consistent with its business environment

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Relevant Standards

- Performance Objectives and Criteria (INPO) NP.1, Nuclear Professionals
- Performance Objectives and Criteria (INPO) RP.1, Radiation Protection Fundamentals
- Performance Objectives and Criteria (INPO) RP.2, Radiation Dose Control
- Performance Objectives and Criteria (INPO) RP.3, Radioactive Contamination Control
- Performance Objectives and Criteria (INPO) RP.4, Radioactive Material Control
- ACAD 02-001 Rev1, “The Objectives and Criteria for Accreditation of Training in the Nuclear Power Industry”
- NEI 07-08, Revision 3, “Generic FSAR Template Guidance for Ensuring That Occupational Radiation Exposures Are As Low As Is Reasonably Achievable (ALARA)”

Relevant Regulatory Requirement

- 10 CFR Part 20, Radiation Protection
- Regulatory Guide 1.8, “Qualification and Training of Personnel for Nuclear Power Plants”
- FSAR, Chapter 12, “Radiation Protection”
- NRC IE Circular No. 81-07, “Control of Radioactively Contaminated Material”
- Regulatory Guide 8.8, “Information Relevant to Ensuring that Occupational Radiation Exposures at Nuclear Power Stations Will Be As Low As is Reasonably Achievable”
- Regulatory Guide 8.10, “Operating Philosophy for Maintaining Occupational Radiation Exposures As Low As is Reasonably Achievable”
- FSAR Chapter 12, “Radiation Protection”

Guidance

- INPO 05-008, “Guidelines for Radiological Protection at Nuclear Power Stations”

Recommended Industry Actions

- Develop a common initial, requalification and continuing training program for self-protection. Training and qualification should be commensurate with worker job functions. Task qualifications will include, but not be limited to, the selection and use of beta and gamma radiation and contamination survey instruments, job coverage techniques and methods, radiation survey and documentation requirements, contamination sampling and analysis, transfer of radioactive materials within the radiological controlled area, and handling and use of radioactive sources.
- Develop the standard oversight structure for site radiation protection organizations to support the self-protection program (e.g. verification of survey results logged by self-protecting workers, routine observations of self-protection worker practices and monitoring of relevant indicators pertaining to RP work practices).
- Define line manager roles and responsibilities for oversight and monitoring of self-protection workers.
- Communicate this self-protection initiative with ANI and the NRC.
Change Management Considerations

Industry Activities

- Industry webinar to provide background for initiative, INPO discussion, and an open forum to clarify expectations and ask questions. Information on the webinar is available at: https://web.inpo.org/Pages/Nuclear-Promise-Issues.aspx
- Discuss at regional RP manager meetings and workshops and routine industry conference calls.
- Update and discuss at INPO RP manager meetings.

Company Actions

- Determine which plant staffs and individuals should be selected for self-protection training and qualification. Consider the following when making this determination:
  - the type of work activities and frequencies assigned to each work group (it may not be cost-beneficial to train and qualify some work groups in self-protection)
  - the level of craft proficiency for the selected workers.
- Implement a training and qualification program (including continuing training) for the selected self-protection candidates using the systematic approach to training.
- Develop a change management plan that includes communication of this initiative to plant staff, the basis for selecting self-protection workers, the training and qualification process, and implementation date.
- Establish a method for workers to obtain current radiological information, instruments, equipment (e.g. smears for contamination surveys) and survey map process tools (software, paper survey maps, etc.).
- Station RP managers to brief line management and lead RP technicians on the scope of the change and their roles and responsibilities, including necessary oversight initiatives to mitigate the risk of HU errors and radiological events.
- Determine if inventory of portable radiation detection instrument is sufficient.
- Complete a detailed cost-benefit analysis that evaluates the potential savings associated with increased self-protection worker efficiencies and RP staff optimization versus the cost of establishing initial and ongoing training programs.

Guiderails

- Self-protection is not permitted in the following areas or activities:
  - airborne radioactivity areas that require DAC-hour tracking, air sampling prior to/during entry or use of respiratory protection
  - EPRI Alpha Level II or III areas
  - radiography
  - entries into BWR containments and areas beyond PWR containment bio-shields
  - removal/handling of irradiated equipment such as in-core detectors, TIPs, SRMs, IRMs, LPRMs, CRDMs, etc.
  - removal of potentially irradiated tools or equipment above water surfaces (e.g., spent fuel pools and reactor cavities)
  - entries into areas where the potential for increased dose rates could result in exceeding regulatory dose limits
  - areas not routinely surveyed by RP
  - free release of materials from the radiologically controlled area
  - no grinding, flapping or welding on surfaces with loose surface contamination and/or fixed contamination that could cause radiological conditions to exceed the radiological conditions stated above.
Station RP management and line managers who oversee workers qualified in self-protection will perform:

- periodic verification of survey results logged by self-protecting workers
- routine observations of self-protection worker practices
- monitoring of relevant indicators pertaining to RP work practices with focus on adverse trends.

Report Your Site’s Results

Please report your company’s implementation of this improvement opportunity, including the date of completion. Send this information along with your company point of contact to EfficiencyBulletin@NEI.org.

Industry Contacts

- Industry champion for this issue: Douglas Noble, 419-321-7780, dlnoble@firstenergycorp.com
- INPO contact: Paul McNulty, 770-644-8812, mcnultypj@inpo.org
- NEI contact: Ellen Anderson, 202-739-8043, exa@nei.org
- On the web: www.nei.org/bulletin1702

Industry Approval:

Fadi Diya, CNO Lead

David P. Igyarto, Institute of Nuclear Power Operations

Anthony R. Pietrangelo, Nuclear Energy Institute