ATTACHMENT 71121.03

INSPECTABLE AREA: Radiation Monitoring Instrumentation and Protective Equipment

CORNERSTONE: Occupational Radiation Safety

INSPECTION BASIS: This inspectable area verifies aspects of the Occupational Radiation Safety cornerstone for which there are no indicators to measure performance. Protection of personnel involved in plant operations or work activities associated with transient high radiation areas, very high radiation areas, or airborne radioactivity areas depends on the accuracy, operability, and proper use of radiation monitoring instruments and other personnel protective equipment.

LEVEL OF EFFORT: Inspect biennially

71121.03-01 INSPECTION OBJECTIVES

01.01 To determine 1) the accuracy and operability of radiation monitoring instruments that are used for the protection of occupational workers; and 2) the adequacy of the program to provide self-contained breathing apparatus (SCBA) for personnel entering and working in areas of unknown radiological hazards and/or potential immediately dangerous to life and health (IDLH) areas.

71121.03-02 INSPECTION REQUIREMENTS

02.01 Inspection Planning. Review the plant FSAR to identify applicable radiation monitors associated with transient high and very high radiation areas including those used in remote emergency assessment. For example, include area radiation monitors associated with in-core instrumentation, transverse in-core probes, radwaste resin transfer piping and polyethylene liner fill and cask loading areas. Emergency assessment instrumentation includes the high-range containment radiation monitor and the post-accident sample system (containment atmosphere, containment sump and reactor coolant sampling capability). Do not repeat any NRC inspection activity for any radiation monitor instrumentation that is included under the Maintenance Rule program.

Note: Applicable instruments include area radiation monitors, continuous air monitors (CAM), criticality monitors, and portable radiation instruments that are used to identify changing radiological conditions such that actions to prevent an overexposure may be taken.

02.02 Identify Additional Radiation Monitoring Instrumentation. Identify the types of portable radiation detection instrumentation used for job coverage of high radiation area

work, other temporary area radiation monitors currently used in the plant, and continuous air monitors associated with jobs with the potential for workers to receive 50 mrem CEDE. If the site is required to monitor for internal exposures, include whole body counter equipment in the review. Identify types of radiation detection instruments utilized for personnel release from the radiologically controlled area.

02.03 Verify Calibration, Operability, and Alarm Setpoint (if applicable) of Several Types of Instruments and Equipment. Verification methods include: review of calibration documentation, observation of licensee source check or calibrator exposed readings, or comparison of source readings using an NRC survey instrument. When applicable, review the detector measurement geometry, calibration method and appropriate selection of calibration sources to closely represent the actual measurement conditions in the plant. When possible, observe electronic and radiation calibration of these instruments if the calibration facility is onsite. Include a review of the alarm set point determinations. Observe in-field source checks. Determine what actions are taken when, during calibration or source checks, an instrument is found significantly out of calibration (>50%). Determine possible consequences of instrument use since last successful calibration or source check. Determine if the out of calibration result was entered into the corrective action program. The inspector should cover at least four instruments, including at least one portable hand-held survey instrument, and one personal monitoring device (e.g., electronic alarm dosimeter, breathing-zone air sampler, etc.).

The licensee's 10 CFR Part 61 source term reviews may be reviewed to determine if the calibration sources used are representative of the plant source term. If scaling factors are used for calibrations, the Part 61 data may be used as a reference to determine if the licensee is properly scaling (e.g., for hard-to-detect radionuclides).

Note: Types of instruments are: ion chamber, G-M, underwater detector, CAM, electronic alarm dosimeters, pocket dosimeters, teledosimetry, personnel contamination monitors, and whole body counters.

02.04 Problem Identification and Resolution

a. Review licensee self-assessments, audits, and Licensee Event Reports and focus on radiological incidents that involved personnel contamination monitor alarms due to personnel internal exposures. For internal exposures >50 mrem CEDE, determine if the affected personnel were properly monitored utilizing calibrated equipment and if the data was analyzed and internal exposures properly assessed in accordance with licensee procedures. Do not duplicate inspection efforts to assess internal dose assessments, taken under Attachment 01, Section 02.02(e). Determine if identified problems are entered into the corrective action program for resolution. The number of events reports examined should not exceed thirty, but should include all event reports involving internal exposures >50 mrem CEDE.

b. Review corrective action program reports related to exposure significant radiological incidents that involved radiation monitoring instrument deficiencies since the last inspection in this area. Interview staff and review documents to

determine if the following activities are being conducted in an effective and timely manner commensurate with their importance to safety and risk:

1. Initial problem identification, characterization, and tracking
2. Disposition of operability/reportability issues
3. Evaluation of safety significance/risk and priority for resolution
4. Identification of repetitive problems
5. Identification of contributing causes
6. Identification and implementation of corrective actions which will achieve lasting results
7. Resolution of non-cited violations (NCVs) tracked in corrective action system(s)
8. Implementation/consideration of risk significant operational experience feedback

Emphasis should be placed on ensuring problems are identified, characterized, prioritized, entered into a corrective action, and resolved.

c. For repetitive deficiencies or significant individual deficiencies in problem identification and resolution identified above, determine if the licensee's self-assessment activities are also identifying and addressing these deficiencies.

02.05 Radiation Protection Technician Instrument Use. Verify the calibration expiration and source response check currency on radiation detection instruments staged for use. Observe radiation protection technicians for appropriate instrument selection and self-verification of instruments operability prior to use. NOTE: This inspection requirement may be performed during the job site inspections accomplished under IP 71121.01

02.06 Self-Contained Breathing Apparatus (SCBA) Maintenance and User Training

a. Based on FSAR, Technical Specifications and Emergency Operating Procedures requirements, review the status and surveillance records of SCBA staged and ready for use in the plant. Inspect the licensee's capability for refilling and transporting SCBA air bottles to and from the control room and operations support center during emergency conditions. Determine if control room operators and other emergency response and radiation protection personnel (assigned in-plant search and rescue duties or as required by EOPs or Emergency Plan) are trained and qualified in the use of SCBA (including personal bottle change-out). Determine if personnel assigned to refill bottles are trained and qualified for that task.

The inspector should include verification of at least three individuals on each control room shift crew, and at least three individuals from each designated department currently assigned emergency duties (e.g., onsite search and rescue duties).

b. Only personnel who possess manufacturer-certified training/qualifications are allowed to perform maintenance and repairs on SCBA components vital to the unit's function. These vital components typically are the regulator and the low-pressure alarm. Review the qualification documentation for onsite personnel designated to perform maintenance on the vendor-designated vital components,

and the vital component maintenance records for three SCBA units currently designated as “ready for service”. For the same three units, ensure that the required, periodic air cylinder hydrostatic testing is documented and up to date, and the DOT required retest air cylinder markings are in place. Review the onsite maintenance procedures governing vital component work, and identify any inconsistencies between licensee procedures and the SCBA manufacturer’s recommended practices. The review should include qualification verification for at least 50% of the designated repair personnel; check three SCBA units maintenance records over the past 5 years; and review procedures covering the low-pressure alarm and pressure-demand air regulator (vital components).

71121.03-03 INSPECTION GUIDANCE

Findings made as a result of problems with SCBAs (used for emergency response, including radiological, fires, etc.) or emergency assessment instrumentation (installed radiation monitors) normally should be processed using the significance determination process (SDP) for emergency preparedness. For example, a failure to properly train a designated SCBA user (e.g., a control room operator with no “hands-on” training for changing air cylinders) is a finding contrary to the training requirement in Part 20, Subpart H. Typically this non-compliance would result in a GREEN finding, using the EP SDP logic branch -- Is this finding a “Failure to Meet Regulatory Requirement” ? Any proposed findings more significant than GREEN relate to whether an EP planning standard was met or not (the next SDP logic gate), and these must be discussed with the appropriate Regional manager.

03.01 and 03.02. No inspection guidance.

03.03 Verify Calibration, Operability, and Alarm Setpoint (if applicable) of Instruments From Selected Instrument Types. Risk informed insights should be a key factor in selection of which instruments are examined by the inspector. For example, instruments used in high dose rate areas should be of higher priority than personal friskers. Teledose, remote alarming area radiation monitors, and survey and dose alarm devices used for diving activities should be high priority items for inspection. If electronic alarm dosimeters are used to satisfy a HRA technical specification requirement, then these devices should be examined periodically. Try to avoid any duplication of NRC inspection efforts, when looking at EP-related equipment.

If an instrument is not calibrated correctly, determine generic applicability, actual and potential exposure impact, and assess the impact with respect to control or emergency preparedness. Verify the deficiency was entered into the licensee corrective action program.

If an instrument is not operable, determine what backup instrumentation or other exposure control barriers exist (e.g., teledosimetry used with electronic pocket dosimeter, or RP technician with survey instrument providing additional coverage). If no backup exists and no other exposure control barriers, determine how long the condition has existed and what was the exposure consequence. Verify the deficiency was entered into the licensee corrective action program and evaluate the corrective actions taken.

03.04 and 03.05. No guidance provided.

03.06 Respiratory Protection - SCBA

a. For recent examples of licensee problems in this area, refer to NRC Information Notices (IN) 98-20 and 99-05. These two INs summarize the recent industry problems with qualification of respirator users, shortcomings in training, inadequate evaluations of emergency conditions and impact on control room operators, and other problems. Inspection findings in this area note shortcomings in control room operator training, focusing on lack of adequate hands-on training (e.g., no practice in changing air cylinders). Note that 10 CFR 20.1703(c)(4) requires respiratory training and Regulatory Guide 8.15 (Rev.1), Section 5.2 describes the staff's position in this area (e.g., user training should include hands-on training, and should demonstrate competency in donning, using and removing the device). Note that it may be necessary to request the licensee to perform a demonstration of SCBA bottle change-out to ensure that the licensee's training program maintains this capability.

b. See pertinent sections of Regulatory Guide 8.15 (Rev. 1), and NUREG-0041 (Rev. 1), for current staff guidance on SCBA acceptable maintenance training, practices and activities for vital respirator components. The respirator manufacturer (vendor) provides required written literature, as well as WEB sites on specific SCBA use and maintenance/repair, specifying required surveillances to ensure continued unit operability. Discuss any differences between the vendor's and the licensee's procedures and practices, and determine their potential impact on unit operability/NIOSH certification.

71121.03-04 RESOURCE ESTIMATE

For planning purposes it is estimated to take 40 hours, on average (with a range of 34 to 45 hours) to perform the requirements of this attachment.

71121.03-05 COMPLETION STATUS

Inspection of the minimum sample size will constitute completion of this procedure in the RPS. MSS for this attachment is defined as the sum of all the inspection requirements. Therefore, all the inspection requirements of the procedure should be completed. The number of inspection requirements in Section 02.01 is one; Section 02.02 is one; Section 02.03 is one; 02.04 is 3 (a-c); Section 02.05 is one; and Section 02.06 is 2 (a-b). The total inspection requirements and MSS is nine. During the inspection if no opportunity is available (e.g., no related corrective action reports (02.04(b)), count that inspection requirement completed for purposes of the MSS reporting.

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