

NRC INSPECTION MANUAL

ARCB

INSPECTION PROCEDURE 71124

RADIATION SAFETY—PUBLIC AND OCCUPATIONAL

Effective Date: January 1, 2018

PROGRAM APPLICABILITY: IMC 2515 App A

71124-01 INSPECTION OBJECTIVE

To independently gather sufficient information by performing a minimum level of baseline inspection to determine whether licensee performance meets the following cornerstone objectives:

01.01 Public Radiation Safety (P). To ensure adequate protection of public health and safety from exposure to radioactive material released into the public domain as a result of routine civilian nuclear reactor operations.

01.02 Occupational Radiation Safety (O). To ensure adequate protection of worker health and safety from exposure to radiation or radioactive material during routine civilian nuclear reactor operations.

71124-02 INSPECTION REQUIREMENTS

02.01 Inspection Planning. Plan and perform inspections in accordance with the following attachments to this procedure:

- Attachment 01: Radiological Hazard Assessment and Exposure Controls (O)
- Attachment 02: Occupational ALARA Planning and Controls (O)
- Attachment 03: In-Plant Airborne Radioactivity Control and Mitigation (O)
- Attachment 04: Occupational Dose Assessment (O)
- Attachment 05: Radiation Monitoring Instrumentation (P, O)
- Attachment 06: Radioactive Gaseous and Liquid Effluent Treatment (P)
- Attachment 07: Radiological Environmental Monitoring Program (P)
- Attachment 08: Radioactive Solid Waste Processing and Radioactive Material Handling, Storage, and Transportation (P, O)

The above list indicates the cornerstones that typically apply to each inspection procedure. Findings from these inspections must be grouped by the inspector into the cornerstone to which they best apply (see inspection guidance tables in the procedures and cornerstone charts in Inspection Manual Chapter (IMC) 2515, "Light-Water Reactor Inspection Program—Operations Phase," Appendix A, Attachment 2, for guidance). Each finding must be aligned with only one cornerstone following application of the significance determination process (SDP), described in IMC 0609, "Significance Determination Process," to avoid double-counting in assessing

performance. Some of the potential findings within the inspectable areas of this inspection procedure impact the licensee's ability to respond to the radiological conditions during an accident, such as findings associated with respiratory protection devices (e.g., self-contained breathing apparatus) or radiation monitoring instrumentation necessary to control radiation exposure of emergency workers. The significance of these findings related to emergency preparedness should normally be assessed against the SDP examples (primarily 4.10 and 4.11) in IMC 0609, Appendix B.

02.02 Problem Identification and Resolution (PI&R). Using the inspection attachments listed above, review a selected sample of issues, verify that the issues **are being identified and resolved**, and verify, for a selected sample of related problems, the effectiveness of the licensee's corrective actions. **IP 71152, "Problem Identification and Resolution," provides further guidance on Routine Reviews of PI&R activities.**

02.03 Third-Party Reviews. Review significant site-specific, third-party evaluation reports for insights into the licensee's program and to aid in selecting areas (samples) for review. Institute of Nuclear Power Operations (INPO) reports are normally reviewed by resident inspectors only. Coordinate with the residents and review regional policy before reviewing INPO documents.

71124-03 INSPECTION GUIDANCE

03.01 General Guidance.

- a. Adequate Protection. The regulatory requirements in Title 10 of the *Code of Federal Regulations* (10 CFR) Part 19, "Notices, Instructions and Reports to Workers: Inspection and Investigations," Part 20, "Standards for Protection against Radiation," and Part 50, "Domestic Licensing of Production and Utilization Facilities," ensure that licensees provide adequate protection of occupational workers and members of the public from exposure to radiation and radioactive materials during the normal operation, including anticipated operational occurrences, of a nuclear power plant. In general, adequate protection from routine exposures is demonstrated by maintaining the resultant doses below the applicable limits and consistent with the as low as reasonably achievable (ALARA) requirements of 10 CFR 20.1101, "Radiation Protection Programs," and 10 CFR 50.36(a). However, in certain instances (such as where the potential for a substantial acute dose is high, or a defective respiratory protection device has been used), the risk to health and safety is not reflected in the resulting dose and must be evaluated individually.
- b. Applicable Performance Indicators. The inspections conducted under this procedure provide information on licensee performance in areas that are not measured by, or not fully measured by, the following performance indicators (PIs): unintended occupational radiation exposure, control of access to high (above 1 rem/hour) and very high radiation areas (Occupational Radiation Safety Cornerstone); and the release of radioactive materials in effluents that exceed a substantial fraction of the design criteria in Appendix I, "Numerical Guides for Design Objectives and Limiting Conditions for Operation to Meet the Criterion 'As Low as is Reasonably Achievable' for Radioactive Material in Light-Water-Cooled Nuclear Power Reactor Effluents," to 10 CFR Part 50 (Public Radiation Safety Cornerstone), as defined in Nuclear Energy Institute (NEI) 99-02, "Regulatory Assessment Performance Indicator Guidelines." In fulfilling the inspection requirements of the attachments, the inspector needs to exercise care to not

spend time inspecting activities or characteristics that are already covered by a PI, although Inspection Procedure (IP) 71151, "Performance Indicator Verification," does gather such information.

The PI in the Public Radiation Safety Cornerstone monitors the performance of the radiological effluent treatment and monitoring program. The PI is based on radiation dose resulting from effluent releases and does not evaluate the performance of the radiological environmental monitoring or the processing, handling, storage, or transportation of solid radioactive materials.

The primary means by which licensees maintain an appropriate level of safety is through an effective problem identification and resolution (PI&R) program to correct deficiencies involving human performance, equipment, programs, and procedures. The inspection program verifies that the NRC's confidence in licensees' programs is still deserved and periodically verifies that the final actions on some of the lower level violations are proper. See Section 03.02.02 below for additional guidance on PI&R.

- c. Risk-Informed, Performance-Based Inspections. The NRC inspection program covers only small samples of licensee activities in any particular area. The principle of "smart sampling" is employed by the inspector in selecting items to review in each area, as opposed to a statistically based random selection. Smart sampling uses risk information and insights (gained from the licensee's quality assurance (QA) audits, independent evaluations, or operational experience) to focus on those aspects of plant operations and licensee activities that could pose the greatest risk to public health and safety. Performance-based inspections evaluate licensee performance by focusing on the outcomes of licensee programs (in terms of the risk of impacting the cornerstone objectives), as opposed to drawing conclusions on whether the licensee is in compliance with a regulation or standard irrespective of the risk impact.

03.02 Specific Guidance.

- a. Inspection Planning. To the extent practical, inspections should be scheduled to coincide with plant evolutions and work activities that could have significant impact on the areas being inspected. Conclusions about the licensee's performance should be based on inspector observation of risk-significant activities. Discussions with plant personnel and reviewing documents should be used to enhance or verify performance-based observations.
- b. PI&R. The Reactor Oversight Process is based on the presumption that licensees have mature, robust programs to self-identify and correct nonconformances and other program deficiencies throughout the conduct of their operations. The purpose of the reviews of PI&R programs within each baseline inspection procedure attachment is to confirm that the licensee is finding, documenting, and correcting (in a timely manner, commensurate with their safety significance) program deficiencies in each of the inspectable areas. The purpose of these PI&R reviews is not to document each nonconformance with a regulatory requirement that the licensee **is tracking through its corrective action process**.

Problem identification and **resolution** programs are an integral part of an effective QA program. Appendix B, "Quality Assurance Criteria for Nuclear Power Plants and Fuel Reprocessing Plants," to 10 CFR Part 50 requires nuclear power plant licensees to

establish a QA program, including measures to control the issuance of instructions, procedures, and drawings, including changes, which prescribe activities affecting the quality of safety-related structures, systems, and components (SSCs), and to inspect the conformance to these documents in the performance of these activities. To the extent that radiation protection activities pertain to safety-related SSCs (e.g., high-range effluent monitors, radwaste systems), they are within the scope of the Appendix B required program. However, several other areas within the radiation protection procedures are not explicitly required to be addressed in the Appendix B QA program. For example, license conditions in the plant technical specifications require QA programs for radiological effluent and environmental monitoring systems. In addition, 10 CFR Part 71, "Packaging and Transportation of Radioactive Material," Subpart H, "Quality Assurance," provides QA requirements applicable to the packaging of licensed radioactive materials for shipment. However, paragraph (f) of 10 CFR 71.101, "Quality Assurance Requirements," states that the QA requirements of 10 CFR Part 50, Appendix B, if applied to the transport of licensed radioactive material, are sufficient to meet the requirements of 10 CFR Part 71, Subpart H. For other aspects of the radiation protection program, Subpart B of 10 CFR Part 20 requires each licensee to develop, document, and implement a radiation protection program and to review the program content and implementation at least yearly. Most licensees include radiation protection procedures in the scope of their QA audits and PI&R programs as part of their QA program, as required by Appendix B to 10 CFR Part 50, in accordance with the guidance in Regulatory Guide 1.33, "Quality Assurance Program Requirements (Operation)."

The inspector should use the guidance in IP 71152 and IMC 2515, Appendix A, when (1) verifying the effectiveness of corrective actions for issues identified that are within the scope of 10 CFR Part 50, Appendix B, and (2) determining that the PI&R program is sufficient to meet the radiation protection review and QA requirements of 10 CFR Parts 20, 50, and 71.

The inspector should determine if the following activities are being conducted in an effective and timely manner (e.g., commensurate with the importance to safety and risk significance), as part of the licensee's review of its Radiation Protection Program:

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 effective corrective actions
7. resolution of noncited violations tracked in corrective action system(s)
8. implementation/consideration of risk-significant operational experience feedback

- c. Third-Party Reviews. The review of third-party audits is intended to gain insights into the licensee's performance in a particular area for the purposes of inspection planning and smart sampling. This inspection requirement does not include a detailed inspection or followup of the licensee's corrective actions resulting from the third-party review findings. See Section 13.01, "Treatment of Third Party Reviews," of IMC 0612, "Inspection Reports," for more specific guidance on how to conduct and document detailed NRC review of third-party evaluations, accreditation reports, findings, recommendations, and corrective actions.

END

Revision History for
IP 71124

Commitment Tracking Number	Accession Number Issue Date Change Notice	Description of Change	Description of Training Required and Completion Date	Comment Resolution and Closed Feedback Form Accession Number (Pre-Decisional, Non-Public Information)
N/A	12/02/09 CN 09-030	Conducted four year search for commitments and found none. This new procedure is being issued as a result of the 2009 ROP IP Realignment. It (with its associated eight attachments) supersedes inspection requirements in IP 71121 and 71122 (and attachments) in their entirety.	09/09/2009	ML092810377
N/A	ML17286A597 12/21/17 CN 17-031	This procedure is being updated to reflect new branch ownership, update the applicability of attachments to ROP Cornerstones and correct minor formatting issues.	N/A	ML17300A478