

# NRC INSPECTION MANUAL

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## INSPECTION PROCEDURE 71124 ATTACHMENT 07

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### RADIOLOGICAL ENVIRONMENTAL MONITORING PROGRAM

Effective Date: March 30, 2020

PROGRAM APPLICABILITY: IMC 2515 App A

CORNERSTONE: Public Radiation Safety

INSPECTION BASES: See IMC 0308 Attachment 2

#### SAMPLE REQUIREMENTS:

Sample Requirements		Minimum Baseline Sample Completion Requirements		Budgeted Range	
Sample Type	Section(s)	Frequency	Sample Size	Samples	Hours
Environmental Monitoring Equipment and Sampling	03.01	Triennial	1 per site	1 per site	29 +/- 4 per site
Radiological Environmental Monitoring Program	03.02	Triennial	1 per site	1 per site	
GPI Implementation	03.03	Triennial	1 per site	1 per site	

#### 71124.07-01 INSPECTION OBJECTIVES

- 01.01 To verify that the Radiological Environmental Monitoring Program (REMP) quantifies the impact of radioactive effluent releases to the environment and sufficiently validates the integrity of the radioactive gaseous and liquid effluent release program.
- 01.02 To verify that the REMP is implemented consistently with the licensee's technical specifications (TS) and/or offsite dose calculation manual (ODCM) and to validate that the radioactive effluent release program meets the design objectives in Appendix I to 10 CFR Part 50.
- 01.03 To ensure that the REMP (1) monitors noneffluent exposure pathways (e.g., onsite spills or leaks, exposures from direct and scattered (sky shine) radiation from plant facilities and components), (2) is based on sound principles and assumptions, and (3) validates that doses to members of the public are within the dose limits of 10 CFR Part 20, "Standards for Protection against Radiation," and 40 CFR Part 190,

“Environmental Radiation Protection Standards for Nuclear Power Operations,” as applicable.

- 01.04 To monitor the licensee’s continued implementation of the voluntary NEI/Industry Ground Water Protection Initiative (GPI).
- 01.05 To conduct a routine review of problem identification and resolution activities per Inspection Procedure (IP) 71152, “Problem Identification and Resolution.”

#### 71124.07-02 GENERAL GUIDANCE

Review the Annual Radiological Environmental Operating Reports (AREOR) and the results of any licensee assessments since the last inspection to enable verifying that the REMP was implemented in accordance with the TS and ODCM. Review the AREOR for changes to the ODCM with respect to environmental monitoring, commitments in terms of sampling locations, monitoring and measurement frequencies, land use census, inter-laboratory comparison program, and analysis of data.

Review the ODCM to identify locations of environmental monitoring stations.

Review the final safety analysis report (FSAR) for information regarding the environmental monitoring program and meteorological monitoring instrumentation.

Review quality assurance audit results of the program to assist in choosing inspection “smart samples.” If the licensee uses a vendor laboratory to analyze the REMP samples, review any audits and technical evaluations performed on the vendor’s program.

Review the annual effluent release report and the 10 CFR Part 61, “Licensing Requirements for Land Disposal of Radioactive Waste,” report, to determine if the licensee is sampling, as appropriate, for the predominant and dose-causing radionuclides likely to be released in effluents.

For each sample, conduct a routine review of problem identification and resolution activities using Inspection Procedure (IP) 71152, “Problem Identification and Resolution.” Per IP 71152, it is expected that routine reviews of Problem Identification and Resolution (PI&R) activities should equate to approximately 10 to 15 percent of the resources estimated for the associated baseline cornerstone procedures, this is a general estimate only based on the overall effort expected to be expended in each strategic performance area. It is anticipated that the actual hours required to be expended may vary significantly from attachment to attachment, depending on the nature and complexity of the issues that arise at the particular facility. Overall, an effort should be made to remain within the 10 to 15 percent estimate on a strategic performance area basis. Inspection time spent assessing PI&R as part of the baseline procedure attachments should be charged to the corresponding baseline procedure.

## 71124.07-03 INSPECTION REQUIREMENTS

### 03.01 Environmental Monitoring Equipment and Sampling Sample

**Verify licensee environmental monitoring equipment is properly located, calibrated and maintained and observe the collection of environmental samples.**

#### Specific Guidance

- a. Walk down air sampling stations and direct radiation monitoring stations (e.g., thermoluminescent dosimeters [TLD]) and consider if they are located as described in the ODCM and to determine the equipment material condition.

Consistent with smart sampling, the air sampling stations should be selected based on the locations in the downwind sectors with the highest concentration per unit release rate ( $X/Q$ ), and highest deposition per unit release rate ( $D/Q$ ), and direct radiation monitoring stations should be selected based on the most risk-significant locations (e.g., those that have the highest potential for public dose impact). Shifts in wind sectors with the highest  $X/Q$  and  $D/Q$  may be detected by comparing several years of the licensee's meteorological data.

- b. For the air samplers selected, consider if the calibration and maintenance records demonstrate adequate operability of these components.
- c. As available, review the calibration & maintenance (or volume verification) records of composite water samplers.
- d. Observe the collection and preparation of samples from different environmental media and consider whether the environmental sampling is representative of the release pathways as specified in the ODCM and whether sampling techniques are in accordance with procedures.
- e. Based on direct observation and review of records, consider if the meteorological instruments are operable, calibrated, and maintained in accordance with guidance contained in the FSAR, and licensee procedures. Consider whether the meteorological data readout and recording instruments in the control room and, if applicable, at the tower are operable.

Compare readout data (i.e., wind speed, wind direction, and delta temperature) in the control room and at the meteorological tower to identify any differences that would indicate that inaccurate data are being used for dose determination.

## 03.02 Radiological Environmental Monitoring Program Sample

### **Verify that the radiological environmental monitoring program is being implemented consistent with the regulations and ODCM.**

#### Specific Guidance

- a. Consider if the licensee has initiated sampling of appropriate media (e.g., ground and surface water, milk, vegetation, sediment, and soil) upon loss of a required sampling station.
- b. As available, evaluate the licensee's actions in response to events that involved a missed sample, inoperable sampler, direct radiation monitoring equipment (e.g., TLD), or anomalous measurement.

Review missed and or anomalous environmental samples to identify if they should be reported in the annual environmental monitoring report. Review the licensee's assessment of any positive sample results (i.e., licensed radioactive material detected above the lower limits of detection (LLDs)). Review the associated radioactive effluent release data that was the source of the released material. Consider if the licensee has addressed any positive indications in the environmental monitoring samples and has adjusted the effluent monitoring program and dose modeling, as appropriate to ensure the accuracy of the models.

- c. Review the licensee's assessment of any positive sample results (i.e., licensed radioactive material was detected above the LLDs).
- d. Consider if records developed since the last inspection, that are important to decommissioning, are retained as required. Licensees should document significant contamination resulting from leaks and spills, as required by 10 CFR 50.75, "Reporting and recordkeeping for decommissioning planning," paragraph (g).
- e. Review any significant changes made by the licensee to the ODCM and review technical justifications for any changed sampling locations. Consider whether the licensee performed the reviews required to ensure that the changes did not affect its ability to monitor the impacts of radioactive effluent releases on the environment.

Changes may be made in response to changes to the land use census, long-term meteorological conditions (3-year average), or modifications to the sampler stations since the last inspection.

- f. Consider if the appropriate detection sensitivities are used for counting samples to satisfy TS/ODCM required LLDs.
- g. Review quality control charts for maintaining radiation measurement instrument status and actions taken for degrading detector performance. If the licensee uses a vendor laboratory to analyze REMP samples, consider if the vendor's quality control program, including inter-laboratory comparison programs, is adequate. If applicable, review the licensee's determination of any bias to the data and the overall effect on the REMP.

03.03 Groundwater Protection Initiative Implementation Sample

***Document incomplete or discontinued elements of the licensee's Groundwater Protection Initiative program [C1].***

Specific Guidance

- a. Compare the licensee's groundwater protection program to the most current revision of NEI 07-07.
- b. Review monitoring results of the Groundwater Protection Initiative (GPI) to determine if the licensee has implemented its program as intended, and to identify any anomalous results. For anomalous results or missed samples, determine if the licensee has identified and addressed deficiencies through its corrective action program.
- c. Observations of incomplete or discontinued elements of the licensee's implementation of the GPI should be documented in accordance with IMC 0611.

71124.07-04 REFERENCES

40 CFR Part 190, "Environmental Radiation Protection Standards for Nuclear Power Operations"

RG 1.21, "Measuring, Evaluating, and Reporting Radioactive Material in Liquid and Gaseous Effluents and Solid Waste"

RG 1.23, "Meteorological Monitoring Programs for Nuclear Power Plants"

RG 1.33, "Quality Assurance Program Requirements (Operation)"

RG 1.109, "Calculation of Annual Doses to Man from Routine Releases of Reactor Effluents for the Purpose of Evaluating Compliance with 10 CFR Part 50, Appendix I"

RG 4.15, "Quality Assurance for Radiological Monitoring Programs (Inception through Normal Operations to License Termination) -- Effluent Streams and the Environment"

RG 4.22, "Decommissioning Planning During Operations"

NUREG-1301, "Offsite Dose Calculation Guidance: Standard Radiological Effluent Controls for Pressurized Water Reactors"

NUREG-1302, "Offsite Dose Calculation Guidance: Standard Radiological Effluent Controls for Boiling Water Reactors"

NUREG-1576, "Multi-Agency Radiological Laboratory Analytical Protocols Manual"

IMC 0611, "Power Reactor Inspection Reports"

IP 71152, "Problem Identification and Resolution"

NRC, "Liquid Radioactive Release Lessons Learned Task Force Report," (ML062650312)

NRC, Safety Guide 23, "Onsite Meteorological Programs"

NRC, "An Acceptable Radiological Environmental Monitoring Program (ML010710060)"

NEI 07-07, "Industry Ground Water Protection Initiative (GPI) – Final Guidance Document, Rev. 1" (ML19142A074), or most recent revision if applicable

NEI 08-08A, "Generic FSAR Template Guidance for Life-Cycle Minimization of Contamination" (ML093480532)

END

Attachment 1: Revision History for IP 71124, Attachment 07

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 supersedes inspection requirements in IP 71121 and 71122.	Yes 09/09/2009	ML092810423
<p>C1 Reference: SRM-SECY-11-019 (August 15, 2011) Senior Management Review of Overall Regulatory Approach to Groundwater Protection</p> <p>CA Note Dated December 14<sup>th</sup>, 2012 (ML12347A290)</p>	ML12321A387 06/06/13 CN 13-013	This revision directs the inspection staff to document observations of incomplete or discontinued implementation of the NEI/industry ground water protection Initiative (GPI). The revision also instructs inspection staff that if the licensee is not implementing the GPI, to review the adequacy of the licensee's implementation of the Decommissioning Planning Rule under 10 CFR 20.1406(c) and 10 CFR 20.1501, including Part 52 licensee requirements to implement the GPI and NEI-08-08A.	N/A	ML13085A201 ML13129A076

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	ML15345A067 04/01/16 CN 16-010	<p>Revisions to the IP 71124.07 procedure attachment were made in response to the 2013 ROP Enhancement Project.</p> <p>This revised procedure includes groundwater monitoring inspection requirements transferred in from IP 71124.06.</p> <p>The revision changed the way samples are counted.</p>	N/A	IP revised only to include new sample sizes. There is no valid comment resolution at this time.
N/A	ML17286A291 12/21/17 CN 17-031	<p>Major editorial revision of IP 71124.07.</p> <p>Section 02 was audited and modified to move guidance to Section 03 and concisely state actions necessary to complete each requirement</p> <p>Modified Inspection Bases to reference applicable regulations. Adjusted guidance in response to ROPFF 71124.06-1743.</p> <p>PI&amp;R was transitioned from an independent sample to a requirement that would be completed as part of each sample. Guidance section updated to reflect resource estimates for routine review of PI&amp;R activities per IP 71152 Section 04.01.</p>	Verbal discussion of changes during 2017 HP Counterpart meeting, 09/06/2017	ML17300A476  Closed FBF 71124.06-1743 ML17300B383

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	ML19253C869 03/04/20 CN 20-014	<p>Major editorial revisions of IP 71124.07 to conform with IMC 0040 formatting guidance</p> <p>This revision also adjusts the inspection frequency from biennial to triennial. Notified the Commission of this change in accordance with Management Directive 8.13, "Reactor Oversight Process" January 31, 2020 (ML19317D673 [Non-public])</p>	<p>Verbal discussion of changes during 2019 HP Counterpart Meeting. 09/04/2019</p>	ML19253C885