



STP Procedure Approval

Reviewing the Non-Common Performance Indicator, Uranium Recovery Program - SA-110

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NOTE

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I. INTRODUCTION

This document describes the procedure for conducting reviews of U.S. Nuclear Regulatory Commission (NRC) Regional and Agreement State uranium recovery program activities using the Non-Common Performance Indicator, Uranium Recovery Program [NRC [Management Directive \(MD\) 5.6](#), *Integrated Materials Performance Evaluation Program (IMPEP)*].

II. OBJECTIVES

- A. To verify the status of an Agreement State or the NRC Region IV uranium recovery program through the performance of five subelements: Technical Staffing and Training; Status of the Uranium Recovery Inspection Program; Technical Quality of Inspections; Technical Quality of Licensing Actions; and Technical Quality of Incident and Allegation Activities.
1. To confirm that technical staffing and training is adequate and well managed, as generally assessed according to STP Procedure [SA-103](#), *Reviewing the Common Performance Indicator, Technical Staffing and Training*.
 2. To confirm that licensees are inspected at prescribed frequencies and to verify that statistical data on the status of the inspection program is maintained and can be retrieved, as generally assessed according to STP Procedure [SA-101](#), *Reviewing the Common Performance Indicator, Status of Materials Inspection Program*.
 3. To confirm that the technical quality of inspections is adequate, as generally assessed according to STP Procedure [SA-102](#), *Reviewing the Common Performance Indicator, Technical Quality of Inspections*.
 4. To confirm that the technical quality of licensing actions is adequate, as generally assessed according to STP Procedure [SA-104](#), *Reviewing the Common Performance Indicator, Technical Quality of Licensing Actions*.
 5. To confirm that the response to incidents and allegations is adequate, as generally assessed according to STP Procedure [SA-105](#), *Reviewing the Common Performance Indicator, Technical Quality of Incident and Allegation Activities*.

- B. To consider the unique needs of a uranium recovery program, while conducting a performance-based evaluation, considering risk information when possible.

III. BACKGROUND

An effective uranium recovery licensing and inspection program depends on having a sufficient number of experienced, knowledgeable, and well-trained technical staff, gauged by both qualitative and quantitative measures.

Periodic inspections of licensed operations are essential to ensure that activities are conducted in compliance with regulatory requirements and consistent with good safety practices. Inspection frequency is based on the potential radiation hazard of the licensee's program, so that the licensee presenting the greatest risk to public health and safety and the environment requires the most frequent inspections. Information regarding the number of overdue inspections is a significant measure of the status of a materials inspection program, and thus the capability for maintaining and retrieving statistical data on the status of an inspection program must exist. At this time, only NRC's Region IV performs radiation safety inspections at uranium recovery facilities. Headquarters staff sometimes assists with confirmatory surveys, as well as ground and surface water hydrology-related inspections.

The licensing program evaluation includes review of licensing actions, decommissioning actions, and financial surety reviews, including notifications and examination of any actions that have been pending for a significant amount of time, to demonstrate effective and efficient regulation. At this time, NRC licensing of uranium recovery facilities is performed by Headquarters staff.

Responses to incidents and allegations must be conducted correctly and timely in order to protect health, safety, and the environment, as well as maintain public trust.

IV. ROLES AND RESPONSIBILITIES

A. Team Leader

Determines which team member is assigned lead review responsibility for this performance indicator. The reviewer(s) should meet the appropriate requirements specified in [MD 5.10](#), *Formal Qualifications for Integrated Materials Performance Evaluation Program (IMPEP) Team Members*.

B. Principal Reviewer

Selects and reviews relevant documentation, conducts staff discussions, evaluates the quality of the uranium recovery program, and maintains a summary of the review for this indicator.

V. GUIDANCE

A. Scope

This procedure applies only to review of the uranium recovery program activities common to the NRC and Agreement States, including 11e.(2) byproduct and source material inspections and licensing activities related to yellowcake production and the construction, operation, and decommission of these facilities.

B. Evaluation Procedures

1. The principal reviewer should specifically refer to MD 5.6, Part II (Performance Indicators) and Part III (Evaluation Criteria), Non-Common Performance Indicator 4 – Uranium Recovery Program. These criteria should apply to program data for the entire review period.
2. Evaluation for each subelement for this Non-Common Performance Indicator should be conducted in a manner similar to, but not necessarily part of the respective Common Performance Indicators.
3. In applying the criteria, the review team may exercise some flexibility to determine the rating for this indicator. The team should take into account the current status of the program and any mitigating factors that may have affected performance.

C. Review Guidelines

1. The response generated by the NRC Region or Agreement State to relevant questions in the IMPEP questionnaire should be used to focus the review.
2. The reviewer should be familiar with NRC Manual Chapter (MC) 2801, *Uranium Mill and 11e.(2) Byproduct Material Disposal Site and Facility Inspection Program*; MC 2641, *In-Situ Leach Facilities Inspection Program*; MC 2602, *Decommissioning Inspection Program for Fuel Cycle Facilities and Materials Licensees*; MC 2604, *Licensee Performance Review*; and MC 2620, *On-Site Construction Reviews at Inactive Uranium Mill Tailings Sites*.

3. The reviewer should be familiar with NUREG-1620, *Standard Review Plan for the Review of a Reclamation Plan for Mill Tailings Sites* and NUREG-1569, *Standard Review Plan for In Situ Leach Uranium Extraction License Applications*.
4. When reviewing the region's program, consider NRC Inspection Procedure (IP) 89001, *In-Situ Leach Facilities*; IP 87654 *Uranium Mill, In-Situ Leach Uranium Recovery, and 11e.(2) Byproduct Material Disposal Site Decommissioning Inspection*; and current applicable Office of Nuclear Material Safety and Safeguards (NMSS) policy.
5. Technical Quality of Licensing Actions is not part of Regional reviews, as uranium recovery licensing activities are performed at NRC Headquarters.
6. Any issues identified in the last IMPEP review should be resolved in accordance with Section V.H.4, STP Procedure [SA-100](#), *Implementation of the Integrated Materials Performance Evaluation Program (IMPEP)*.

D. Review Details

1. Technical Staffing and Training
 - a. The Regional and Agreement State health physics staff have training and experience comparable to that recommended in NRC Regulatory Guide 3.31, Section 2.4.1, *Radiation Safety Officer*. Required training for Regional staff is listed in MC 1246, Appendix A, *Section XII: Training Requirements for Uranium Recovery Inspector*.
 - b. Staff is available (or access to staff in other divisions/departments, or to consultants) that have expertise in materials licensing and/or inspection; civil (geotechnical) and mechanical engineering; geology (including seismology and volcanology), surface and ground water hydrology; chemical safety; and environmental science.
 - c. The program includes refresher training for important skills and training specific to uranium recovery including the associated chemical and industrial hazards.
 - d. The staff is trained in interviewing and other communication skills.
 - e. Mentoring of new staff and de-briefing of departing staff to retain corporate knowledge/memory is routine, as is appropriate supervision of program staff.

- f. Key staff are able to attend industry or professional meetings or symposia.
 - g. Staff receive some training in risk assessment, and are aware of the recommendations in NUREG/CR-6733, *A Baseline Risk-Informed, Performance-Based Approach for In Situ Leach Uranium Extraction Licensees*.
 - h. Regional staff are aware of the Occupational Safety and Health Administration (OSHA) (IMC 1007, *Interfacing Activities Between Regional Offices of NRC and OSHA*) and Mine Safety and Health Administration (MSHA) responsibilities and how to report related findings according to the Memorandum Of Understanding Relating To NRC-Licensed Facilities Between NRC and OSHA (53 FR 43950, October 31, 1988) and MSHA (45 FR 1315, January 4, 1980).
 - i. Regional staff are aware of the State/U.S. Environmental Protection Agency groundwater and underground injection control regulations.
 - j. Regional staff are familiar with NRC Regulatory Guides 3.11.1 (Operational Inspection and Surveillance of Embankment Retention Systems for Uranium Mill Tailings, ML003740229), 3.67 (Standard Format and Content for Emergency Plans for Fuel Cycle and Materials Facilities), 8.11 (Applications of Bioassay for Uranium), 8.22 (Bioassay at Uranium Mills), 8.30 (Health Physics Surveys in Uranium Recovery Facilities), and 8.31 (Information Relevant to Ensuring that Occupational Radiation Exposures at Uranium Recovery Facilities Will be ALARA). Also, NUREG-1757, vol. 1-3 (Consolidated NMSS Decommissioning Guidance). These documents are available at the website [www.nrc.gov/electronic reading room/doc-collections](http://www.nrc.gov/electronic/reading_room/doc-collections).
2. Status of the Uranium Recovery Inspection Program
- a. Evaluate any missed or late inspections (>25 percent of the frequency) in the context of the activities at the uranium mills during the review period (i.e., under construction, operating, on stand-by, or in decommissioning).
 - b. Include a qualitative evaluation that examines the justifications for a Region or Agreement State to revise its internal inspection frequencies.
 - c. When reviewing the region's program, the principal reviewer should consult with the Uranium Processing Section of the Division of Fuel Cycle Safety and Safeguards, NMSS, regarding revised inspection performance goals or other

programmatic adjustments. Also, use inspection data provided by the Region on the questionnaire and information provided during the on-site review.

- d. When reviewing an Agreement State, use inspection data provided by the State from the IMPEP questionnaire and information provided during the on-site review. The State should not be penalized for failing to meet internally developed inspection schedules that are more aggressive than those specified in MC 2801 and 2641, or current NRC policy. In addition, the reviewer should be sure that overdue inspections are tallied in a consistent fashion, (i.e., those more than 25 percent late than the minimum frequency specified in MC 2801 and 2641).

3. Technical Quality of Uranium Recovery Inspections

- a. The risk significance of chemical hazards at a uranium recovery facility, in addition to the radiological hazards, are considered during an inspection. The inspector has access to chemical safety experts to consult with if a chemical safety issue is noticed on an inspection. The inspector understands the regulatory authority and relationships between agencies in regulating chemical hazards at a uranium recovery mill (e.g., OSHA, MSHA, U.S. Environmental Protection Agency, and State agencies).
- b. Decommissioning projects are inspected in accordance with written inspection procedures to confirm the safety of decommissioning procedures. Inspections focus on safety of licensee procedures and implementation, release of effluents to the environment, public and worker exposure, and suitability of decontaminated areas and structures for release.
- c. Decommissioning recordkeeping (see 10 CFR 40.36(f)) is periodically checked for completeness, especially before commencement of decommissioning.
- d. Sufficient radiological surveys, given the extent and significance of any residual contamination, are required under 10 CFR 40.42 before license termination. The licensee radiation survey results are validated through a closeout inspection or confirmatory survey according to current NMSS policy. See Inspection Procedures 87654, *Uranium Mill, In-Situ Leach Uranium Recovery, and 11e.(2) Byproduct Material Disposal Site Decommissioning Inspection*, and 83890, *Closeout Inspection and Survey* (however, only portions of the MARRSIM approach in NUREG-1575 are applicable to mills where the 100 m² survey unit/area applies).

4. Technical Quality of Licensing Actions

- a. Select a sample of licensing actions that are representative based on the number and type of actions performed during the review period, including a cross-section of as many different technical reviewers and categories as practical.
- b. The selected licensing actions should be reviewed for technical correctness and quality, including adequacy, accuracy, completeness, clarity, specificity and consistency.
- c. The selected licensing actions should conform to applicable regulations and license conditions in all aspects, based on regulatory guidance, checklists, and policy memoranda, to ensure consistency with current accepted practice and standards.
- d. Examine records which document deficiencies in licensee supporting information, including significant errors, omissions, or missing information. Such records include letters, file notes of a telephone conversation, and other documents.
- e. Note how well the decision-making process is documented, including any significant deficiencies related to health and safety. Determine if decisions are under proper signature by an authorized official.
- f. If the initial review suggests a weakness on the part of the program, or problems with respect to one or more aspects of the technical review in support of licensing actions, additional samples should be reviewed to determine the extent of the problem or identify a systematic weakness. The finding, if any, should be documented in the report.
- g. In reviewing licensing actions against the criteria, the team may exercise flexibility in making the determination for this sub-indicator. The team should take into account the current status of the program and any mitigating factors that may have prohibited the program from completing needed technical review, for example, a written Technical Evaluation Report, normally required for supporting a licensing action. If management took appropriate steps to work off the significant backlog, an unsatisfactory rating may not be appropriate.
- h. Criteria for timeliness of licensing actions exist and are routinely followed.

- i. Review justifications for the Region or Agreement State to grant an exception or exemption from an applicable rule, regulatory guide, or industry standard.
 - j. Determine that adequate financial assurance for the decommissioning of sites has been established in accordance with regulatory requirements in Criterion 9 (and Criterion 10 for mills) of Appendix A, 10 CFR Part 40. Financial assurance mechanisms are reviewed and maintained to ensure that they would be executable. Review the itemized decommissioning cost estimates to ensure that the surety amount provides sufficient funding for decommissioning (including restoration) in the event that the licensee liquidates or is otherwise unable to pay for decommissioning.
 - k. During the on-site review of an Agreement State, special effort is made to identify local regulatory guidance and how such guidance may be uniquely applied.
5. Technical Quality of Incident and Allegation Activities
- a. A representative number of incidents and allegations are sampled from the entire review period. If possible, all incidents and allegations are reviewed.
 - b. Selected incidents and allegations are reviewed for attention to risk significant aspects, discernment of root causes, and conformance to applicable rules, guides and license conditions, in accordance with the guidance provided in Section V of STP Procedure SA-105, *Reviewing the Common Performance Indicator, Technical Quality of Incident and Allegation Activities*.
 - c. The review includes all pertinent event records entered in the Nuclear Material Events Database (NMED). Event actions and notifications are conducted as specified in STP Procedure SA-300, *Reporting Material Events* for Agreement States and comparable Regional guidance. If there are any issues or questions with the event data then the NMED project manager in NMSS should be consulted before the on-site review.

VI. APPENDICES

Not Applicable.

VII. REFERENCES

1. NRC Inspection Manual Chapters:

MC 1007, *Interfacing Activities Between Regional Offices of NRC and OSHA.*
MC 1246, *Formal Qualification Programs in the Nuclear Material Safety and Safeguards Program Area.*
MC 2801, *Uranium Mill and 11e.(2) Byproduct Material Disposal Site and Facility Inspection Program.*
MC 2641, *In-Situ Leach Facilities Inspection Program.*
MC 2602, *Decommissioning Inspection Program for Fuel Cycle Facilities and Materials Licensees.*
MC 2604, *Licensee Performance Review.*
MC 2620, *On-Site Construction Reviews at Inactive Uranium Mill Tailings Sites.*

2. NRC Inspection Procedures:
IP 87654, *Uranium Mill, In-Situ Leach Uranium Recovery, and 11e.(2) Byproduct Material Disposal Site Decommissioning Inspection.*
IP 87654, *Uranium Mill, In-Situ Leach Uranium Recovery, and 11e.(2) Byproduct Material Disposal Site Decommissioning Inspection*
IP 83890, *Closeout Inspection and Survey.*
IP 89001, *In-Situ Leach Facilities.*
3. NRC Management Directive 5.6, *Integrated Materials Performance Evaluation Program (IMPEP).*
4. NRC Management Directive 5.10, *Formal Qualifications for Integrated Materials Performance Evaluation Program (IMPEP) Team Members.*
5. Memorandum to M. Virgilio, February 13, 2004 (ADAMS Accession No: ML040480067).
6. NUREG Series:
NUREG-1569, *Standard Review Plan for In Situ Leach Uranium Extraction License Applications*, June 2003.
NUREG-1575, *Multi-Agency Radiation Survey and Site Investigation Manual*, August 2000.
NUREG-1620, *Standard Review Plan for the Review of a Reclamation Plan for Mill Tailings Sites*, June 2003.
NUREG-1757, vol. 1-3, *Consolidated NMSS Decommissioning Guidance*, September 2003.
NUREG/CR-6733, *A Baseline Risk-Informed, Performance-Based Approach for In Situ Leach Uranium Extraction Licensees*, September 2001.
7. Regulatory Guides:
RG 3.11.1, *Operational Inspection and Surveillance of Embankment Retention Systems for Uranium Mill Tailings* (ML003740229).

RG 3.67, *Standard Format and Content for Emergency Plans for Fuel Cycle and Materials Facilities.*

RG 8.11, *Applications of Bioassay for Uranium.*

RG 8.22, *Bioassay at Uranium Mills.*

RG 8.30, *Health Physics Surveys in Uranium Recovery Facilities.*

RG 8.31, *Information Relevant to Ensuring that Occupational Radiation Exposures at Uranium Recovery Facilities Will be ALARA).*

8. Regulatory Issue Summary - *Recent Changes to Uranium Recovery Policy*, November 30, 2000.
9. STP Procedure SA-100, *Implementation of the Integrated Materials Performance Evaluation Program (IMPEP).*
10. STP Procedure SA-101, *Reviewing the Common Performance Indicator, Status of Materials Inspection Program.*
11. STP Procedure SA-102, *Reviewing the Common Performance Indicator, Technical Quality of Inspections.*
12. STP Procedure SA-103, *Reviewing the Common Performance Indicator, Technical Staffing and Training.*
13. STP Procedure SA-104, *Reviewing the Common Performance Indicator, Technical Quality of Licensing Actions.*
14. STP Procedure SA-105, *Reviewing the Common Performance Indicator, Technical Quality of Incident and Allegation Activities.*
15. STP Procedure SA-300, *Reporting Material Events.*