



**Office of Nuclear Material Safety and Safeguards (NMSS)  
Procedure Approval**

***Reviewing the Non-Common Performance Indicator,  
Low-Level Radioactive Waste Disposal Program  
SA-109***

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Issue Date:

Review Date:

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**NOTE**

***Any changes to the procedure will be the responsibility of the Office of Nuclear Material Safety and Safeguards (NMSS) Procedure Contact. Copies of the NMSS procedures will be available through the NRC Web site.***

## **I. INTRODUCTION**

This document describes the procedure for conducting reviews of Agreement State Low-Level Radioactive Waste (LLRW) programs using the Non-Common Performance Indicator, Low-Level Radioactive Waste Disposal Program in accordance with NRC [Management Directive \(MD\) 5.6](#), *Integrated Materials Performance Evaluation Program (IMPEP)*.

## **II. OBJECTIVES**

The objective is to determine if an Agreement State's LLRW disposal program is adequate to protect public health, safety, and security. Five sub-elements are used to make this determination: (1) Technical Staffing and Training; (2) Status of the LLRW Inspection Program; (3) Technical Quality of Inspections; (4) Technical Quality of Licensing Actions; and (5) Technical Quality of Incident and Allegation Activities.

1. To confirm that qualified and trained technical staff are available to license, regulate, control, inspect, and assess the operation and performance of the LLRW disposal facility. The evaluation of staffing and training needs is generally assessed according to Office of Nuclear Material Safety and Safeguards (NMSS) Procedure [SA-103](#), *Reviewing the Common Performance Indicator, Technical Staffing and Training*, and this procedure.
2. To confirm that the LLRW facility is inspected at prescribed frequencies and to verify that statistical data on the status of the inspection program are maintained and can be retrieved, as generally assessed according to NMSS Procedure [SA-101](#), *Reviewing the Common Performance Indicator, Status of Materials Inspection Program*, and this procedure.
3. To confirm that the technical quality of LLRW inspections is adequate, as generally assessed according to NMSS Procedure [SA-102](#), *Reviewing the Common Performance Indicator, Technical Quality of Inspections*, and this procedure.
4. To confirm that the technical quality of licensing actions is adequate, as generally assessed according to NMSS Procedure [SA-104](#), *Reviewing the Common Performance Indicator, Technical Quality of Licensing Actions*, and this procedure.

5. To confirm that the response to incidents and allegations is adequate, as generally assessed according to NMSS Procedure [SA-105](#), *Reviewing the Common Performance Indicator, Technical Quality of Incident and Allegation Activities*.

## **CKGROUND**

The LLRW activities span from pre-licensing/construction, pre-operation, operation, closure, to post-closure. For the purposes of this procedure, the evaluation of the Agreement State program for the regulation of a LLRW facility is best accomplished by considering the facility at one of two phases: its operational phase or its closed phase. The operational phase would be those periods where the facility is undergoing initial licensing, construction, pre-operations, operations (acceptance of waste from other licensees) through site closure. During this period, the licensee (or operator) has an active presence at the site and the facility actively operates under a license and is subject to increased interaction with the Agreement State.

The closed phase would refer to the period when the facility has entered its post-closure period (see 10 CFR 61.29) and then its institutional control period. During these periods, activities at the site are significantly reduced and generally limited to observation, monitoring and minor maintenance and repairs, first by the licensee (post-closure) and then the site owner (institutional control). During this period, the activities at the site are normally dictated by the facility's site closure plan issued as part of the operator's or site owner's license.

## **IV. ROLES AND RESPONSIBILITIES**

### **A. Team Leader**

1. Determines which team member is assigned the lead review responsibility for this non-common performance indicator. Assigns a second team member as needed to complete the objectives of this procedure.
2. Assists in developing a plan to conduct further review or to identify root causes for any potential health, safety, security, or environmental protection issues identified by the review.

### **B. Reviewer for an Operational or Closed LLRW Facility**

1. Meets the appropriate requirements specified in SA-111, *Formal Qualifications for Integrated Materials Performance Evaluation Program (IMPEP) Team Members and Team Leaders*.
2. Is familiar with Inspection Manual Chapter (IMC) [2401](#), *Near-Surface Low-Level Radioactive Waste Disposal Facility Inspection Program*; [MD 8.8](#), *Management of Allegations*; NMSS Procedure [SA-300](#); NMSS Procedure [SA-400](#), *Management of Allegations*; IMC 2800, *Materials Inspection Program*; applicable NRC and/or Agreement State regulations; and the operation of the Nuclear Materials Event Database (NMED).

3. Conducts inspector accompaniments (unless they are conducted by an alternate team member) before the on-site portion of the review, and maintains a reference summary document related to the accompaniments.
4. Reviews relevant documentation related to the LLRW program review and conducts management and staff discussions.
5. Reviews and evaluates the quality of technical staffing and training programs and determines whether staffing levels and expertise are sufficient for the LLRW program.
6. Reviews and evaluates selected inspection casework files for the LLRW program, conducts staff discussions, and maintains a reference summary document of all inspection casework reviewed.
7. Reviews and evaluates selected licensing actions for the LLRW program, conducts staff discussions, and maintains a summary of all licensing actions reviewed.
8. Conducts staff discussions, evaluates the quality of the LLRW program, and maintains a summary of the review for this indicator.
9. Informs the Team Leader of their findings throughout the review.
10. Completes their portion of the IMPEP report for the performance indicator(s) reviewed.
11. Attends the IMPEP Management Review Board meeting for the review and is prepared to discuss their findings (this can be done either in-person or via teleconference).

## **V. GUIDANCE**

### **A. Scope**

1. This procedure applies to the review of the LLRW program and related activities common to Agreement States. In particular, the procedure primarily applies to activities involving licensing, control, management, operation, inspection, closure, and/or post-closure of radioactive waste disposal under NRC's [10 CFR Part 61](#) and/or equivalent State regulations. The review of program elements (including regulations) required for compatibility are not in scope of this indicator but are addressed by another non-common performance indicator. The scope of the review of the LLRW program should take the phase in the life-cycle into consideration. For example, a closed LLRW facility in the institutional control period will need emphasis placed on different areas than an active operational LLRW facility or a closed facility that is placing an engineered cap on the site.

2. This procedure evaluates the Agreement State's performance over the period of time since the last IMPEP review. This time frame is defined as the review period.
3. The review guidance and details in Subsections D and E are examples of evaluation elements and are not requirements.

**B. Preparation**

1. The reviewer(s) should request relevant documentation prior to the on-site review by performing the following:
  - a. Obtain a copy of the periodic meeting summary(s) for the review period.
  - b. Obtain a copy of the last IMPEP report. Any issues identified in the last IMPEP review that remain open should be resolved in accordance with Section V.H.4 of NMSS Procedure [SA-100](#), *Implementation of the Integrated Materials Performance Evaluation Program (IMPEP)*. The reviewers should also consider recommendations made in the last IMPEP report.
  - c. Contact NMSS' Low Level Waste Branch and the Regional State Agreements Officer (RSAO) to discuss the status of the Agreement State's LLRW facility and obtain a list of incidents and allegations related to the LLRW program.
  - d. Review the responses generated by the Agreement State, relevant to LLRW questions in the IMPEP questionnaire.
  - e. Review the list of reference documents in Section VI to identify which will be most useful for this review. This list of reference documents needed is based on the LLRW facility status.
2. The reviewer(s) coordinates with the team leader, the NRC Region, and the Agreement State to accompany State inspectors during an inspection of the LLRW disposal facility before the on-site portion of the IMPEP review. The reviewer observes an inspection and reviews inspection procedures and reports usually available on site, with emphasis on inspection approaches, measurements, and related health, safety, and security issues.
3. The reviewer(s) should consider the status of the LLRW disposal program (operational or closed), while conducting a performance-based evaluation, considering risk information when possible.

C. Evaluation Procedures

1. The reviewer(s) should specifically refer to [MD 5.6](#), Part II (*Performance Indicators*) and Part III (*Evaluation Criteria*) of Non-Common Performance Indicator 3 *Low-Level Radioactive Waste Disposal Program*. These criteria should apply to program data for the entire review period.
2. In applying the criteria, the reviewer(s) should take into account the current status of the program regarding the life cycle of the LLRW disposal facility during the review period. Any mitigating factors that may have affected the performance should be reviewed. The reviewer(s) should evaluate the State inspections and licensing actions pertaining to each module or segment of the facility. The reviewer(s) should integrate these segments or modules to achieve an overall evaluation of the status and quality of inspection and licensing actions.
3. The reviewer(s) will evaluate each sub-indicator for this non-common indicator in the same general manner as outlined in the respective IMPEP performance indicator procedures ([SA-101](#), [SA-102](#), [SA-103](#), [SA-104](#), or [SA-105](#)).
4. The reviewer(s) should follow the guidance given in NMSS Procedure SA-100, *Implementation of the Integrated Materials Performance Evaluation Program (IMPEP)*, for discussing technical findings with staff, supervisors, and managers.
5. The reviewer(s) will provide one overall rating for this indicator.

D. Review Guidelines

1. The reviewer(s) should read the responses generated by the Agreement State, relevant to LLRW questions in the IMPEP questionnaire, and use this information to identify potential LLRW issues.
2. The reviewer(s) coordinates with the team leader, the NRC Region, and the Agreement State to accompany State inspectors during an inspection of the LLRW disposal facility before the on-site portion of the IMPEP review. The reviewer(s) observes inspections and reviews inspection procedures and reports, usually available on site, with emphasis on inspection approaches, measurements, and related health and safety issues.
3. The reviewer(s) should be familiar with the basic regulatory guides involving LLRW disposal siting, licensing, environmental impacts, performance assessment, waste characterization, and waste averaging. With regard to inspection activities, the reviewer(s) should be familiar with the Inspection Manual Chapter (IMC) 2401, *Near Surface Low-Level Radioactive Waste Facility Inspection Program* and the associated Inspection Procedures (IP) associated with status of the LLRW disposal facility. Section VI provides a list of relevant documents.

4. The reviewer(s) should resolve any issues identified in the last IMPEP that remain open in accordance with Section V.H.4 of NMSS Procedure [SA-100](#), *Implementation of the Integrated Materials Performance Evaluation Program (IMPEP)*.

#### E. Review Details

##### 1. Technical Staffing and Training

The review details presented in NMSS Procedure [SA-103](#) should be read before this detailed review. The following specific review details apply to the LLRW program reviews:

- a. The reviewer(s) should ensure that all managers and technical staff involved in LLRW receive a generic training course in radiation safety and health physics to ensure understanding of potential risks and self-protection from potential radiation exposure. The reviewer(s) should ensure technical staff involved in the inspection of LLRW facilities for environmental monitoring have additional training courses in the area of radiation exposures and radiological environmental transport monitoring and analysis. Inspection staff should be familiar with NRC's [Inspection Procedure 88010](#), *Operator Training/Retraining*. A list of NRC sponsored courses for State staff are listed in [IMC 1248](#). The reviewer(s) should ensure the State has a developed and documented training program for its staff, including required core (or basic) training; specialized training; supplemental (or advanced) training; and refresher training, as required, for staff designated position and/or assigned duties. The NRC/Organization of Agreement States (OAS) Training Working Group report entitled: *Recommendations for Agreement State Training Programs (October 1997)* can be used as a guide to develop staff training needs for the LLRW program.
- b. The reviewer(s) should ensure there are staff (or access to staff in other divisions/departments, or to consultants) available with expertise in materials licensing and/or inspection; health physics and radiation protection; radioactive materials' transportation and inspection; civil (geotechnical) and mechanical engineering; geology/geochemistry, surface water and groundwater hydrology; chemical safety; and environmental science. The principal reviewer may conduct interviews with staff to evaluate program staffing qualifications and potential needs.



- c. The reviewer(s) should ensure the LLRW program has plans and schedules for development and implementation of a training program for the staff. The reviewer(s) should ensure records of staff training and qualification journals include refresher training for important skills and training specific to LLRW management, including radiation protection, transportation, treatment, storage, and disposal of radioactive waste, as well as environmental monitoring aspects and associated chemical and industrial hazards.
- d. The reviewer(s) should ensure staff receive training in risk and performance assessment, and are made aware of [NUREG-2175](#), *Guidance for Conducting Technical Analyses for 10 CFR Part 61*. The reviewer(s) should ensure staff are aware of NRC's risk informed performance-based approaches and probabilistic risk assessment methods.

## 2. Status of the LLRW Inspection Program

The review details presented in NMSS Procedure SA-101 should be used for this inspection. [IMC 2401](#) describes the specific radiological safety inspection program for near surface LLRW disposal facilities and defines specific inspection requirements.

The reviewer(s) should evaluate the current phase(s) of the program activity (e.g., pre-licensing/construction, pre-operation, operation, closure, and post closure). The reviewer(s) should consider that the primary purpose of the inspection program is to verify if the LLRW facilities are operated and managed throughout their entire life cycle in a manner that provides protection from radioactivity to employees, members of the public, and the environment. The reviewer(s) should be aware that the State typically conducts routine and non-routine LLRW inspections. Depending on whether the regulatory program chooses to maintain an onsite inspector at the LLRW facility, inspections may be conducted on a daily, weekly, or monthly basis. Routine inspections may include the following LLRW aspects: waste shipments; waste manifest; waste characteristics and volumes; shipment vehicle surveys and records; waste packages; marking, labeling, and placarding; emergency response information; and general shipping inspections for compliance with regulatory requirements by DOT, NRC, and/or Agreement State.

The reviewer(s) should ensure that site security, trenches, disposal cells, and site boundary inspections should be conducted on a routine basis. Non-routine inspections are typically more extensive and conducted in modules or segments on an annual basis. Non-routine inspections may include the following modules or segments: personnel exposures and dosimetry (e.g., internal, bioassay, and external dosimetry); personnel qualifications and training; radiological control for air monitoring; radiological control surveys; surface water and groundwater monitoring; emergency response plans and drills; waste receipt, treatment, storage, and disposal operations; instrument calibrations and check sources; radiological posting; respiratory protections, As Low As is Reasonable Achievable (ALARA) records; and records of incidents and allegations.

When reviewing an Agreement State program, the reviewer(s) should use inspection data provided by the State from the IMPEP questionnaire and information provided during the onsite review. The State should not be penalized for failing to meet internally developed inspection schedules that are more aggressive than those specified in current NRC policy. In addition, the reviewer(s) should ensure that overdue inspections are tallied in a consistent fashion, based on the frequency specified in IMC 2401 and [2602](#).

In general, the following specific review details may apply to the LLRW program reviews:

- a. The reviewer(s) should conduct an inspection accompaniment before conducting an on-site IMPEP review. The purposes of the inspection accompaniment are to: (a) observe the current status of LLRW facility safety and security; (b) observe an on-site inspection to become familiar with inspection modules and procedures; (c) evaluate the adequacy of inspection tools and equipment used; (d) evaluate the completeness of onsite inspections; and (e) examine inspection reports, inspection records, and findings. If an on-site inspector is stationed at the facility, the reviewer(s) may observe this inspector as part of the inspection accompaniment.
- b. The reviewer(s) should be aware that LLRW facility inspections are typically conducted in routine and non-routine fashion, as explained above, and may be conducted in segments, modules, or through an on-site inspector. The reviewer(s) should ensure that the State conducts each module or segment annually at the LLRW site. The reviewer(s) should be aware that the Agreement State may break the inspection into modules or segments to be more efficient, effective, and timely. Nevertheless, the reviewer(s) should ensure that all inspection modules or segments were integrated, as necessary.
- c. The reviewer(s) should evaluate routine inspections and assess the adequacy and frequency needed for safety, security, and to demonstrate compliance with regulatory requirements and license conditions. The reviewer(s) should evaluate non-routine inspections through identification of each inspection module or segment and any missed or late inspections (>25 percent of the frequency) for each module or segment during the IMPEP review period. In this regard, the reviewer(s) should review the license, license conditions and amendments, and current LLRW activities. The reviewer(s) should evaluate the need for any additional inspection areas or modules taking into consideration new activities and the current life cycle of the facility.
- d. The reviewer(s) should perform a qualitative evaluation of the justifications by an Agreement State for revision of its internal inspection frequencies.



### 3. Technical Quality of LLRW Inspections

The review details presented in NMSS Procedure SA-102 should be used by the reviewer(s) for the evaluation. The reviewer(s) should consider the life cycle of the inspected LLRW facilities and address the completeness of the inspection to cover all necessary modules or segments of LLRW activities. The quality of the modular inspection can be evaluated by examining each module inspection report for timeliness, completeness, and follow-up on inspection findings. For example, during an inspection accompaniment, LLRW IMPEP reviewers should observe State inspector(s) and evaluate inspection methods, adequacy of instruments used, survey of vehicles and waste packages. A reviewer should also examine routine inspection records and files and evaluate completeness of the inspection reports, inspection findings, and follow-up actions for mitigation measures. The reviewer should also examine the quality of Agreement State inspection records for staff dosimetry and exposure records, and follow-up actions to reduce exposures below action levels. The reviewer(s) should review the State inspection of environmental monitoring activities and subsequent inspection reports for completeness and adequacy as another indicator of the quality of inspection. The following specific review details may apply to the LLRW program reviews:

- a. The reviewer(s) should review inspection documentation and interview inspectors to gain an understanding of the risk significance of radiological and chemical hazards at an LLRW facility . The reviewer(s) should determine whether the inspector used proper and calibrated instruments or tools to detect radioactivity and potential radiation exposure. The reviewer(s) should determine whether the inspector has access to chemical safety experts or to consultants if a chemical safety issue is noticed on an inspection. In addition to potential radiological hazards, the reviewer(s) should determine whether the inspector understands the regulatory authority and relationships between agencies in regulating waste shipments, potential chemical hazards, and potential environmental releases at an LLRW disposal facility including waste storage and treatment facilities (e.g., Occupational Safety and Health Administration (OSHA), Mine Safety and Health Administration (MSHA), U.S. Environmental Protection Agency (EPA), U.S. Department of Transportation (DOT), and State agencies).
- b. The reviewer(s) should evaluate records of each module, or segment, of the LLRW program for completeness and follow-up actions. The reviewer(s) should also determine whether inspection findings, including violations, are communicated to the licensee in a timely fashion and whether licensee responses are evaluated and documented by the State's LLRW regulatory program.

- c. The reviewer(s) should determine if the Agreement State's inspection of clean-up and decommissioning projects (within the facility), or release of equipment, vehicles, or cars, after offloading of waste shipments, are inspected in accordance with a written inspection procedure to confirm the safety of decommissioning and the safety of release of equipment. The reviewer(s) should ensure that inspections focus on radiological safety aspects, implementation of safety procedures, potential effluent releases to the environment, public and worker's exposure, and suitability of decontaminated areas, equipment, and structures for release.
- d. The reviewer(s) should review inspection documentation to confirm inspectors are reviewing workers' exposure records and ALARA records to ensure radiological exposure levels are minimized.
- e. The reviewer(s) should ensure the quality and adequacy of environmental monitoring data (air, soil, surface-water, and/or groundwater) and evaluation of data analysis, if applicable, for potential radionuclide releases above threshold limits has been properly addressed.
- f. The reviewer(s) should review inspection data regarding the quality and performance of liners and covers placed at the LLRW disposal facility, to ensure compliance with the required standards. Not all facilities may utilize liners and covers.
- g. The reviewer(s) should review inspection records for waste shipments, to ensure that radiological and physical/chemical characteristics of the waste are consistent with license requirements and NRC's and DOT's regulations and guidance.
- h. The reviewer(s) should examine decommissioning records for completeness, especially before commencement of decommissioning. This includes ensuring that the Agreement State has obtained from the LLRW owner the necessary fund or has reasonable assurance of obtaining the necessary funds, or a combination of the two to cover the estimated costs of conducting all licensed activities over the planned operating life of the project, including costs of construction and disposal (See Subpart E of 10 CFR Part 61).
- i. The reviewer(s) should interview staff and review records to ensure there is sufficient radiological monitoring and surveys of any potential on-site/off-site residual contamination, before license termination and site closure occurs. The reviewer(s) should ensure the Agreement State staff validate licensee's survey results through a close-out inspection or confirmatory survey.

#### 4. Technical Quality of Licensing Actions

The review details presented in the NMSS Procedure SA-104 should be used for the evaluation. The reviewer(s) should determine the current life cycle of the licensed facility (e.g., pre-licensing/construction, pre-operation, operational, closure, or post-closure phase). Each phase of the LLRW disposal facility may require different licensing actions. For example, the pre-licensing/construction phase may require an extensive review of licensing actions regarding site selection, site performance assessment, disposal cell designs, license conditions, and technical specifications of liners and engineering barriers. The pre-operational phase may require examination of State licensing actions regarding each component of the LLRW engineering system and planned disposal operations or processes. The operational phase may require modifications of license conditions, expansion of LLRW disposal activities, mitigation measures, site security, modification of cell design, and/or LLRW management controls. The closure and post-closure phase licensing actions may involve on-site, buffer zone, and off-site environmental monitoring activities, mitigation and clean-up measures, and financial assurance and institutional control issues. In addition, the following specific review details may apply to the LLRW program reviews:

- a. The reviewer(s) should review a sample of licensing actions that are representative based on the number and type of actions performed during the review period should be reviewed. As practical, a cross-section of as many different technical reviewers and categories should be included.
- b. The reviewer(s) should ensure that selected licensing actions have been reviewed for technical correctness and quality, including adequacy, accuracy, completeness, clarity, specificity, and consistency. Reviewer(s) should examine licensing actions with supporting technical documents (e.g., safety evaluation reports and/or environmental impact statement) .
- c. The reviewer(s) should ensure that selected licensing actions 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. The reviewer(s) should review records that document deficiencies in licensee supporting information, including significant errors, omissions, or missing information, should be examined. Such records include letters, file notes of a telephone conversation, and other documents.
- e. The reviewer(s) should examine how well the decision-making process is documented, including any significant deficiencies related to health and safety. The reviewer(s) should determine if decisions are made under a proper signature by an authorized official.
- f. If the reviewer(s) identifies a weakness in the initial licensing review, or problems regarding 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 reviewer(s) may exercise flexibility in assessing the performance of the Program's licensing action approvals. The reviewer(s) 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 which is customarily a requisite for supporting a licensing action. The reviewer(s) should take into account if management took appropriate steps to address the licensing issues, an unsatisfactory rating may not be appropriate.
- h. The reviewer(s) should verify the justifications for the Agreement State to grant an exception or exemption from an applicable rule, regulatory guide, or industry standard.
- i. The reviewer(s) should determine whether adequate financial assurance for the decommissioning and site closure has been established in accordance with regulatory requirements and applicable guidance. The reviewer(s) should examine financial assurance records to determine whether financial assurance mechanisms have been properly reviewed and maintained to ensure that they will be executable and that they provide sufficient funding for decommissioning and closure, if the licensee liquidates or is otherwise unable to pay for remedial actions or decommissioning.
- j. The reviewer(s) should determine during the on-site review if the Agreement State has made a special effort to develop or identify local regulatory guidance and how such guidance may be uniquely applied to the LLRW disposal facility.

#### 5. Technical Quality of Incident and Allegation Activities

The review details presented in NMSS Procedure SA-105 should be used for the evaluation. In addition, the following specific review details may apply to the LLRW program reviews:

- a. The reviewer(s) should coordinate with the NMSS and Regional Allegation Coordinators to obtain a listing of the LLRW concerns and allegations submitted to the NRC through the concerned Region.
- b. The reviewer(s) should review the State responses regarding incidents and allegations.
- c. The reviewer(s) should examine a representative number of incidents and allegations files at the State from the entire review period. If possible, all incidents and allegations should be reviewed.

- d. The reviewer(s) should focus on: (a) risk significant aspects; (b) discernment of root causes; (c) confidentiality and protection of alleged's identity; (d) conformance to applicable specific rules, guides, license conditions, or general guidance provided in Section V, SA-105, and (e) follow-up actions for closure of allegations when reviewing incidents and allegations.
- e. The reviewer(s) should include all pertinent event records entered in the Nuclear Material Events Database (NMED). The reviewer(s) should verify whether event actions and notifications are conducted as specified in SA-300.

6. IMPEP Review of an LLRW Disposal Facility During Closure/Post-Closure Phase

The term *closure* is typically used to encompass LLRW activities that must be carried out to allow issuance of a license amendment for the disposal-site closure. The LLRW disposal-site closure is followed by a period of *post-closure or institutional control* for observation of performance, environmental monitoring, and maintenance. The post-closure period is followed by an institutional control period of up to 100 years (see 10 CFR 61.7(b)(4) and 10 CFR 61.59(b)). Where LLRW disposal sites are operating under Agreement State regulation it is anticipated that responsibility for regulation and inspection of closure and post-closure activities will continue to reside with the Agreement States. The licensee develops a closure plan for review and approval of the State.

The reviewer(s) of LLRW disposal facilities during the closure/post-closure phases should focus on review of the site-closure plan approved by the Agreement State and implementation activities associated with any portion of the plan and should also be familiar with LLRW closure phase inspection procedures listed in IMC 2401. The IMPEP review, during site-closure/post-closure phases, is generally conducted to evaluate conformance with applicable regulations under [10 CFR Part 20](#) (Standards for Protection against Radiation) and 10 CFR Part 61 (Licensing Requirements for Land Disposal of Radioactive Waste). Conformance with license conditions and applicable regulations to these phases (e.g., 10 CFR §§ 61.26-61.31 or Agreement State compatible regulations) must be evaluated. The reviewer(s) should be aware that it is likely a licensee will implement a portion of the closure plan while LLRW active operations continue elsewhere onsite. The closure plan itself, as amended during site operation should be reviewed to assess adequacy of the procedural or scheduling modifications. The reviewer(s) will evaluate the Agreement State inspection during the closure phase to ensure that the licensee has implemented all elements of the closure plan and the State has approved initiation of the post-closure observation and maintenance.



The reviewer(s) should determine if the Agreement State regulator examined any monitoring and observational data collected by the licensee during the closure and post-closure phases. The reviewer(s) should assess if the licensee compared the data to performance assessment and site stability analysis results generated during earlier phases of facility operation. If the data did not agree with the analysis, the reviewer(s) should determine if modifications were made to the analysis or facility design, or if the differences were determined to be insignificant to public health and safety.

The IMPEP review during the institutional control phase encompasses Agreement State LLRW activities such as: (a) LLRW disposal-site record keeping; (b) review of site safety and security; (c) review of environmental monitoring data and records and follow-up, as appropriate based on trend analysis; (d) review of disposal site performance records for conformance with the safety criteria in 10 CFR Part 20 and 10 CFR Part 61; (e) review of site repair and maintenance activities and records; and (e) review of financial assurance records and activities pertaining to license transfer, termination, and institutional controls.

## **VI. REFERENCES**

General IMPEP related documents:

1. NMSS Procedure [SA-100](#), *Implementation of the Integrated Materials Performance Evaluation Program (IMPEP)*.
2. NMSS Procedure [SA-101](#), *Reviewing the Common Performance Indicator, Status of Materials Inspection Program*.
3. NMSS Procedure [SA-102](#), *Reviewing the Common Performance Indicator, Technical Quality of Inspections*.
4. NMSS Procedure [SA-103](#), *Reviewing the Common Performance Indicator, Technical Staffing and Training*.
5. NMSS Procedure [SA-104](#), *Reviewing the Common Performance Indicator, Technical Quality of Licensing Actions*.
6. NMSS Procedure [SA-105](#), *Reviewing the Common Performance Indicator, Technical Quality of Incident and Allegation Activities*.
7. NMSS Procedure [SA-300](#), *Reporting Material Events*.
8. NRC [Management Directive 5.6](#), *Integrated Materials Performance Evaluation Program (IMPEP)*.

Documents for both an operational and a closed LLRW facility:

1. NRC Inspection Manual, [Inspection Manual Chapter \(IMC\) 1248](#), *Qualification Programs for Federal and State Materials and Environmental Management Programs*.
2. NRC Inspection Manual, [Inspection Manual Chapter \(IMC\) 2401](#), *Near-Surface Low-Level Radioactive Waste Disposal Facility Inspection Program* (Issue date: 11/27/01).
3. NRC Inspection Manual, [Inspection Manual Chapter \(IMC\) 2410](#), *Conduct of Observation Audits*
4. NRC Inspection Manual, [Inspection Manual Chapter \(IMC\) 2800](#), *Materials Inspection Program*.
5. NRC [Inspection Procedure \(IP\) 30703](#), *Management Entrance/Exit Interviews*.
6. NRC [Inspection Procedure \(IP\) 83822](#), *Radiation Protection*.
7. NRC [Inspection Procedure \(IP\) 83890](#), *Closeout Inspection and Survey*
8. NRC [Inspection Procedure \(IP\) 86750](#), *Solid Waste Management & Transportation of Radioactive Material*.
9. NRC [Inspection Procedure \(IP\) 87102](#), *Maintaining Effluents from Material Facilities as Low as Is Reasonably Achievable (ALARA)*.
10. NRC [Inspection Procedure \(IP\) 88005](#), *Management Organization and Controls*.
11. NRC Inspection Procedure 80025 *Maintenance and Surveillance of Safety Controls*
12. NRC [Inspection Procedure \(IP\) 88035](#), *Radioactive Waste Management*.
13. NRC [Inspection Procedure \(IP\) 88045](#), *Effluent Control and Environmental Protection*.
14. NRC [Inspection Procedure \(IP\) 88050](#), *Emergency Preparedness*.
15. NRC [Regulatory Guide 4.15](#), *Quality Assurance for Radiological Monitoring Programs (Inception through Normal Operations to License Termination) – Effluent Streams and the Environment*
16. NRC [Regulatory Guide 4.18](#), *Standard Format and Content of Environmental Reports for Near Surface Disposal of Radioactive Waste*.
17. NRC [NUREG-0945](#), *Final Environmental Impact Statement on 10 CFR Part 61: Licensing Requirements for Land Disposal of Radioactive Waste*; Technical Position.
18. NRC [NUREG-2175](#), *Guidance for Conducting Technical Analyses for 10 CFR Part 61*
19. NRC [NUREG/CR-6346](#), *Hydrologic Evaluation Methodology for Estimating Water Movement through the Unsaturated Zone at Commercial Low-Level Radioactive Waste Disposal Sites*.
20. NRC [NUREG-1854](#), *NRC Staff Guidance for Activities Related to U.S. Department of Energy Waste Determinations*
21. [Low-Level Waste Disposal Information](#) on the NRC Web site includes, but is not limited to the following documents:
  - i. Branch Technical Position on Concentration Averaging and Encapsulation, dated February 2015, (ADAMS Accession Nos.: ML12254B065, ML12326A611, and ML16096A278).
  - ii. Interim Guidance on Blending of Low-Level Radioactive Waste, dated March 17, 2011 (ML110480850).

- iii. Branch Technical Position on Waste Form, Rev.1, dated January 24, 1991 (ML033630746).

Documents specifically for an operational LLRW facility:

1. NRC [Inspection Procedure \(IP\) 84100](#), *Special Nuclear Material Inspections at Near Surface Low-Level Waste Disposal Facilities in Agreement States*.
2. NRC Inspection Procedure (IP) 84850 *Radioactive Waste Management - Inspection of Waste Generator Requirements of 10 CFR Part 20 and 10 CFR Part 61*
3. NRC [Inspection Procedure \(IP\) 84900](#) *Low Level Radioactive Waste Storage*
4. NRC [Inspection Procedure \(IP\) 86740](#), *Inspection of Transportation Activities*.
5. NRC [Regulatory Guide 4.19](#), *Guidance for Selecting Sites for Near Surface Disposal of Low-Level Radioactive Waste*.
6. NRC NUREG-1200, *Standard Review Plan for the Review of a License Application for a Low-Level Radioactive Waste Disposal Facility*.
7. NRC [NUREG/CR-6567](#), *Low-Level Radioactive Waste Classification, Characterization, and Assessment: Waste Streams and Neutron-Activated Metals*.

Documents specifically for a closed LLRW facility:

1. NRC Inspection Manual, [Inspection Manual Chapter \(IMC\) 2602](#), *Decommissioning Oversight and Inspection Program for Fuel Cycle Facilities and Materials Licensees*
2. NRC [Inspection Procedure \(IP\) 87104](#), *Decommissioning Inspection Procedure for Materials Licensees*.
3. NRC [NUREG-1757](#), *Consolidated Decommissioning Guidance*.
4. NRC [NUREG/CR-6647](#), *Adsorption and Desorption Behavior of Selected 10 CFR Part 61 Radionuclides from Ion Exchange Resin by Waters of Different Chemical Composition*

**VII. ADAMS REFERENCE DOCUMENTS**

For knowledge management purposes, all previous revisions of this procedure, as well as associated correspondence with stakeholders that have been entered into NRC's Agencywide Documents Access and Management System (ADAMS) are listed below.

<b>No.</b>	<b>Date</b>	<b>Document Title/Description</b>	<b>Accession Number</b>
1	7/2/2004	STP-04-047, Opportunity for Comments on Draft of Two New IMPEP Procedures Regarding Review of Uranium Recovery Programs and Low-Level Waste Programs	ML041880157
2	6/20/05	STP Procedures SA-109, Reviewing the Non-Common Performance Indicator, Low-Level Radioactive Waste Disposal Program (Redline/Strikeout Version)	ML061640294
3	6/20/05	Summary of Comments on SA-109	ML061640301
4	5/16/06	STP Procedures SA-109, Reviewing the Non-Common Performance Indicator, Low-Level Radioactive Waste Disposal Program	ML061640290
5	6/30/05	STP-05-050, Final STP Procedure SA-109	ML051810484
6	7/14/09	NMSS-09-051, Opportunity to Comment on Draft Revisions to SA-108 and SA-109	ML091330602
7	7/14/09	NMSS Procedure SA-109 Draft Revision	ML091330114
8	1/22/10	Procedure SA-109, Reviewing the Non-Common Performance Indicator, Low-Level Radioactive Waste Disposal Program	ML092740597
9	TBD	NMSS Procedure SA-109 Draft Revision	ML