



## STP Procedure Approval

### *Reviewing the Non-Common Performance Indicator, Low-Level Radioactive Waste Disposal Program Reviews*

**SA-109**

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Issue Date:

Review Date:

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#### ***NOTE***

*The STP Director's Secretary is responsible for the maintenance of this master copy document as part of the STP Procedure Manual. Any changes to the procedure will be the responsibility of the STP Procedure Contact.*

## **I. INTRODUCTION**

This document describes the procedure for conducting reviews of Agreement State Low-Level Radioactive Waste (LLRW) program using the Non-Common Performance Indicator 3: Low-Level Radioactive Waste Disposal Program [NRC Management Directive (MD) 5.6, *Integrated Materials Performance Evaluation Program* (IMPEP)].

## **II. OBJECTIVES**

- G. The generic objective is to evaluate the status of the LLRW disposal program of an Agreement State to provide reasonable assurance that the performance objectives promulgated in 10 CFR 61.41 through §61.44, or in Agreement State compatible regulations, will be met. These objectives include: protection of the general population from releases of radioactivity, protection of individuals from inadvertent intrusion, protection of individuals during operations, and stability of the disposal facility after closure. The specific objective is to evaluate the performance of Agreement State's LLRW disposal program through the assessment of five sub-indicators, as discussed below: (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 (see Section V below for details).
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. Depending on the life cycle of the facility, qualified technical staff, and/or consultants, should be available as needed to conduct/overview LLRW activities within a reasonable time period during the pre-licensing, construction, operation, closure, and post-closure phases of the facility. For example, qualified staff should be available to conduct an acceptance review of LLRW disposal facility license application within 15 months during the pre-licensing phase. The evaluation of staffing and training needs are generally assessed according to State Agreements (SA) procedure SA-103, "Reviewing Common Performance Indicator #3, 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 SA-101, "Reviewing Common Performance Indicator, Status of Materials Inspection Program," and this procedure."

When reviewing the Agreement State status of LLRW inspection, the IMPEP reviewer(s) should consider the specific phase of the LLRW facility life cycle. Therefore the Agreement State inspections may be conducted during either one or more the following phases: (a) the pre-licensing and construction phase; (b) the pre-operation phase; (c) the operation phase; (d) the closure phase; and (e) the post-closure phase. Examples of inspections corresponding to these phases are: (a) inspection of performance assessment approaches, methods, and computations for compliance with the performance criteria of the LLRW facility; (b) inspections of compliance with the technical specifications or the required performance criteria of the engineering systems, components, and/or structures (e.g., liners, concrete barriers, and/or pre-operational environmental monitoring inspections); (c) inspection of LLRW facility management and operational controls (e.g., inspection of licensee operational procedures; workers' exposures and ALARA record; quality assurance records; waste classification, waste-form, and waste characterization data; waste shipments' manifests, packages, and labeling; operator qualifications and training; compliance with disposal site license conditions; and inspection of operational effluent releases and environmental monitoring records); (d) site closure plans, inspection of covers, maintenance of barriers or structures, and/or closeout inspection surveys; and (e) inspection of long-term environmental monitoring.

3. To confirm that the technical quality of LLRW inspections is adequate, as generally assessed according to [SA-102](#), "Reviewing Common Performance Indicator #2, Technical Quality of Inspections," and this procedure."

The technical quality of inspection is typically conducted through an accompaniment of Agreement State inspection of the LLRW facility. The quality of inspection is also evaluated through an onsite review of completed inspection reports, QA/QC assessment, and evaluation of Agreement State inspector(s) regarding use of appropriate methods and calibrated instruments. Agreement State management overview and involvement in inspection as well as evaluation of actions for timely follow-up on inspection findings are also used in evaluation of this sub-indicator.

4. To confirm that the technical quality of licensing actions is adequate, as generally assessed according to [SA-104](#), "Reviewing Common Performance Indicator #4, Technical Quality of Licensing Actions," and this procedure.

LLRW licensing action's reviews may include compliance with the State licensing and regulatory requirements for: type of waste products and volumes, site and waste characteristics, performance assessment criteria, operational procedures, financial qualifications and assurances, and actions related to license renewal and

amendments. The basis for major licensing decisions should be fully documented in a safety evaluation report. Specific licensing actions and decisions are largely dependant on the life cycle (e.g., phases) of the licensed LLRW disposal facility. Evaluation of the technical quality of licensing actions should include a review of the safety evaluation reports pertaining to these actions. Evaluation of the quality of licensing actions should also include an assessment of ongoing requests and supporting documents for amendment, modifications, and/or renewal of the LLRW license. LLRW facility license renewal may require detailed performance assessment evaluations, safety analysis, and public and stake holders involvement in the renewal decision process. Under ceratin circumstances, the State may decide to prepare an environmental impact statement (EIS) and go through the NEPA process. In general, this reviewer should focus on licensing actions and decisions that may have long-term or short-term implications to the health and safety of workers, the public, or the environment.

5. To confirm that the response to incidents and allegations is adequate, as generally assessed according to [SA-105](#), “Reviewing Common Performance Indicator #5, Response to Incidents and Allegations.”
- B. The IMPEP review should consider the unique needs of the LLRW disposal program, while conducting a performance-based evaluation, considering risk information when possible. For examples, the unique needs for developing an effective LLRW disposal site performance assessment process and measures should consider the following performance aspects: (a) consideration of future site conditions, processes, and events; (b) performance of engineering barriers; (c) the time-frame for LLRW site performance assessment; (d) treatment of sensitivity and uncertainty in LLRW performance assessment; and (e) role of performance assessment during operational and closure periods. The unique needs of the LLRW performance assessment methodology may require a modular approach to enable assessment and modeling of the disposal system components and processes. These components and processes may include: (a) source terms; (b) disposal cell design and engineering barriers; (c) LLRW disposal operations; (d) potential radionuclide transport via surface water infiltration, groundwater, and air; and (e) assessment of potential dose impacts and exposures to the public and workers. Considering the unique needs of the LLRW disposal program, inspection of the facility is preferably conducted using a modular approach and subsequent integration of specific inspection modules to achieve an overall assessment of the performance of the disposal facility.

### **III. BACKGROUND**

The ability to conduct effective licensing and inspection of LLRW program depends primarily on having a sufficient number of experienced, knowledgeable, and well-trained technical personnel.

Therefore, qualitative as well as quantitative measures of staff needs, skills, and training must be considered. For example, apparent trends in staffing, staff qualifications compared with designated activities or positions, and staff completed training should be used as qualitative and quantitative measures to gauge the status of technical staffing and training. Staff interviews and review of staff qualification journals, in consideration of established Agreement State training plans, should be used in evaluation of staffing and training.

Agreement State periodic inspections of licensed LLRW disposal facilities are essentially conducted to ensure that LLRW activities are conducted in compliance with regulatory requirements and consistent with good safety practices. Inspection frequency, designated by a priority, should be based on the potential radiation hazard of each module of the licensee's program such that a module presenting the greatest risk to workers and to public health and safety and the environment would require the most frequent inspection. LLRW inspections are typically conducted in segments or modules to ensure adequate and timely inspection. Information regarding the number of overdue inspections for each module is a significant measure of the status of LLRW inspection program. In this context, the capability of maintaining and retrieving statistical data on the status of an inspection program or a module must exist.

The quality of LLRW inspection is essential to ensure protection of workers and the public and to ensure compliance with license and regulatory requirements, particularly those requirements associated with the health and safety and protection of the environment. For example, the following factors may be used in assessment of the quality of inspection: (a) use of proper instrumentation for inspection; (b) use of monitoring data and exposure records as well as adequate analysis and proper interpretation of data; (c) quality and adequacy of inspection reports; (d) promptness in communication of inspection findings and follow-up actions; and (e) inspection accompaniments of managers.

The licensing program evaluation includes review of license requirements and conditions; license amendments and renewals; licensing actions; safety and environmental reports supporting licensing actions; security of handled radioactive materials; release of contaminated vehicles, waste containers and equipment; placing of liners and covers; cleanup and decommissioning actions; financial surety reviews; notifications; and examination of any actions that have been pending for a significant amount of time, to determine if there are potential health and safety impacts.

Responses to incidents and allegations must be conducted correctly and in a timely manner to protect health and safety of workers and the public, and minimize environmental impacts, as well as maintain public trust.

#### **IV. ROLES AND RESPONSIBILITIES**

##### **A. Team Leader**

The team leader for the Regional or State review determines which team member is assigned lead review responsibility (e.g., a principal reviewer) for this non-common performance indicator. The LLRW program reviewer(s) should meet the appropriate requirements specified in [MD 5.10](#), *Formal Qualifications for Integrated Materials Performance Evaluation Program Team Members*. The team leader assists in developing a plan to conduct further review or to identify root causes for any potential health, safety, or environmental protection issues identified by the review. Before the formal IMPEP review, the team leader assists in coordination of LLRW inspection accompaniments by the reviewer(s).

##### **B. Principal Reviewer**

The principal reviewer (PR) is responsible for selecting and reviewing relevant documentation related to the LLRW program review. The PR is also responsible for conducting an inspection accompaniment before the formal IMPEP review. The PR is responsible for conducting staff discussions, evaluating the quality of the LLRW program, and maintaining a summary of the review for this indicator. The PR is responsible for writing the relevant sections of the IMPEP report and participating in the exit meeting and in the MRB meeting. If a significant issue is identified, the reviewer should immediately discuss it with the team leader.

#### **V. GUIDANCE**

##### **A. Scope**

1. This procedure applies only to review of the status of the LLRW program and related activities common to Agreement States. In particular, the procedure 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 similar State regulations.
2. This procedure evaluates the Agreement State quantitative and qualitative performance over the period of time since the last IMPEP review. This time frame is defined as the review period.
3. The review details in Subsection D are examples of evaluation elements and are not intended to be requirements.

**B. Evaluation Procedures**

1. The principal reviewer 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. Evaluation for each sub-indicator for this non-common indicator should be conducted in the same general manner as outlined in the respective Office of States and Tribal Programs (STP) procedures (SA-103, SA-101, SA-102, SA-104, or SA-105) for the corresponding common performance indicator.
3. In applying the criteria, the review team should take into account the current status of the program regarding the life cycle of the LLRW disposal facility during the IMPEP performance period. Any mitigating factors that may have affected the performance should be reviewed. The team should evaluate the State inspections and licensing actions pertaining to each module or segment of the facility. The review team should integrate these segments or modules to achieve an overall evaluation of the status and quality of inspection and licensing actions.

**C. Review Guidelines**

1. The response generated by the Agreement State, relevant to LLRW questions in the IMPEP questionnaire, should be used to focus the IMPEP review on LLRW issues.
2. The PR coordinates with the team leader, the NRC Region, and the State to accompany State inspection of the LLRW disposal facility before the formal IMPEP review. The PR observes inspection and reviews inspection procedures and reports usually available onsite, with emphasis on inspection approaches, measurements, and related health and safety issues.
3. The reviewer should be familiar with NRC Inspection Manual Chapters 401 (“Near-Surface Low-Level Radioactive Waste Facility Inspection Program”); 2410 (“Conduct of Observation Audit”); 84100 (“Special Nuclear Material Inspections at Near Surface Low-Level Waste Disposal Facilities in Agreement States”); 84101 (“Radioactive Waste Management”); 84521 (“Radwaste-Startup”); 84750 (“Radioactive Waste Treatment, and Effluent and Environmental Monitoring”); 84850 (“Radioactive Waste Management - Inspection of Waste Generator Requirements of 10 CFR 20 and 10 CFR 61”); 84900 (“Low-Level radioactive Waste Storage”); 2602 (“Decommissioning Inspection Program for Fuel Cycle Facilities and Materials Licensees”); and 2604 (“Licensee Performance Review”).
4. The reviewer should be familiar with the basic regulatory guides involving LLRW disposal siting, licensing, environmental impacts, performance assessment, waste

characterization, and waste averaging. These guidance documents include, but are not limited to, the following: NUREG-1200 [“Standard Review Plan for the Review of a License Application for a Low-Level Waste Disposal Facility” (Rev. 3)]; NUREG-1199 (“Standard Format and Content Guide for a License Application for a Low-Level Waste Disposal Facility”); NUREG-1300 (“Environmental Standard Review Plan for the Review of a License Application for a Low-Level Radioactive Waste Disposal Facility”); NUREG-0945 (“Final Environmental Impact Statement on 10 CFR Part 61: Licensing Requirements for Land Disposal of Radiative Waste”); Technical Position (on “Concentration Averaging and Encapsulation,” January 17, 1995); Branch Technical Position (on “Waste Form,” Rev.1, January 24, 1991); Regulatory Guide 4.19 (“Guidance for Selecting Sites for Near Surface Disposal of Low-Level Radioactive Waste”); *Federal Register*, Vol. 60, No. 158, August 16, 1995, pp. 4262-42630 (“Use of Probabilistic Risk Assessment Methods in Nuclear Regulatory Activities” [Final policy Statement]; and NUREG-1573 (“A Performance Assessment Methodology for Low-Level Radioactive Waste Disposal Facilities).

5. When reviewing States inspection of LLRW disposal facilities and/or LLRW storage activities, the reviewer should be familiar with pertinent procedures. Examples of these procedures include, but are not limited to: 84850 (“Inspection of Waste Generator Requirements of 10 CFR Part 20 and Part 61”); 30703 (“Management Entrance/Exit Interviews”); 83822 (Radiation Protection”); 83890 (“Closeout Inspection and Survey”); 84900 (“Low-Level Radioactive Waste Storage”); 84101 (“Radioactive Waste Management”); 84100 (“SNM Inspection at LLW Disposal Facilities”); 86750 (“Solid Waste Management & Transportation of RAM”); 88045 (“Environmental Protection”); 87102 [“Maintaining Effluents from Material Facilities As Low As Is Reasonably Achievable (ALARA)”]; 86750 (“Solid Radioactive Waste Management and Transportation of Radioactive Materials”); 86740 (“Inspection of Transportation Activities”); 88005 (Management Organization and Controls”); 88010 (“Operator Training/Retraining”); 88035 (“Radioactive Waste Management”); 88050 (“Emergency Planning”); 88045 (“Environmental Programs”); 92701 (“Follow-up, for Inspection”); 92702 (“Follow-up on Violations/Deviations”); 92703 (“Confirmatory Action Letters”); 93007 (“OSHA Interface Activities”); and 94702 (“Participation in Licensee Meeting”). Additional procedures may also include current Office of Nuclear Material Safety and Safeguards (NMSS) policy procedures and memoranda applicable to LLRW programs.
6. Technical Quality of Licensing is evaluated based on assessment of the quality and promptness of licensing actions, completed licensing activities; and licensing corrective actions to ensure health and safety of workers, health and safety of the public, and protection of the environment. Further, assurance that security measures are in place for the shipped, stored, and/or disposed of radioactive materials is becoming an important aspect of the LLRW IMPEP licensing reviews. Examples of significant licensing actions include: approval of variations in waste characteristics, waste concentration averaging, procedures in waste handling and

processing, liners and cover properties, and disposal cell design. The review team should review documents supporting significant licensing actions focusing on health and safety issues associated with these actions.

7. Any issue identified in the last IMPEP review that remains open should be resolved in accordance with Part 4, Section H, of STP Procedure [SA-100](#), “Implementation of the Integrated Materials Performance Evaluation Program (IMPEP).”

D. Review Details

1. Technical Staffing and Training

The review details presented in STP Procedure [SA-103](#) (“Technical Staffing and Training”) should be evaluated before this specific detailed review. The following specific review details may apply to the LLRW program reviews, also:

- a. The Agreement State health physics staff should have received 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 NUREG-1246, Appendix A, “Section VIII: Training Requirements for Division of Waste Management Inspectors and License Reviewers.” It is recommended 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. Technical staff involved in the inspection of LLRW facilities for environmental monitoring should 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”). Suggested courses for State staff are listed in Attachment 1 of STP Procedure SA-600, “Training Criteria for Agreement State Personnel.” The State should develop and document a 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)” should be used as a guide to develop staff training needs for the LLRW program.
- b. Staff (or access to staff in other divisions/departments, or to consultants) should be 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 PR may conduct interviews with staff to evaluate program staffing qualifications and potential needs.

- c. The LLRW program should have plans and schedules for development and implementation of a training program for the staff. The program should keep records of staff training and qualification journals and 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 staff should be trained in interviewing and other communication skills.
- e. Mentoring of new staff and debriefings of departing staff to retain corporate knowledge/memory should be routine, as there should be an appropriate and adequate supervision of program staff.
- f. Key staff should be able to attend industry or professional meetings or symposia.
- g. Staff should receive some training in risk and performance assessment, and should be made aware of the NUREG-1573 (“A Performance Assessment Methodology for Low-Level Radioactive Waste Disposal Facilities”). Staff should also be aware of NRC’s risk informed performance-based approaches and probabilistic risk assessment methods.
- h. Staff should be aware of the Occupational Safety and Health Administration (OSHA) regulations and interfacing activities. In addition, staff should be aware of the “Mine Safety and Health Administration (MSHA)” responsibilities and how to report related findings. Examples of how to report findings, in accordance with NRC-OSHA/MSHA interfacing practices, can be found in the “Memorandum of Understanding Between NRC and OSHA” as related to NRC’s licensed facilities (53 FR 43950, October 31, 1988) and MSHA (45 FR 1315, January 4, 1980).

2. Status of the LLRW Inspection Program

The review details presented in the OSP Procedure SA-101 (“Status of Materials Inspection Program”) should be evaluated. NRC’s Inspection Manual Chapter 2401 describes the specific radiological safety inspection program for near surface LLRW disposal facilities and defines specific inspection requirements. The LLRW IMPEP review team should evaluate the current phase(s) of the program activity (e.g., pre-licensing/construction, pre-operation, operation, closure, and post-closure). The team 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 State typically conducts routine and non-routine LLRW inspections. Routine inspections are usually conducted frequently on a daily, weekly, and/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. Site security, trenches, disposal cells, and site boundary inspections should be conducted on routine basis. Non-routine inspections are typically more extensive and conducted in modules or segments on annual basis. Non-routine inspection 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 receiving, treatment, storage, and disposal operations; instruments calibrations and check sources; posting; respiratory protections, ALARA records; and records of incidences and allegations. In general, the following specific review details may apply to the LLRW program reviews:

- a. The LLRW review staff should conduct an inspection accompaniment before conducting a formal IMPEP review. The purposes of the inspection accompaniment are: (a) observe current status of LLRW facility safety and security; (b) observe onsite inspection to become familiar with inspection modules and procedures; (c) evaluate adequacy of inspection tools and equipment used; (d) evaluate completeness of onsite inspection; and (e) examine inspection reports, inspection records, and findings.
- b. The review staff should be aware that LLRW facility inspections are typically conducted in routine and non-routine fashion and in segments or modules as explained above. Each module or segment should be conducted annually at the site. Breaking the inspection into modules or segments is more efficient, effective, and timely. Nevertheless, for evaluation of the overall inspection status, all inspection modules or segments should be considered and integrated.
- c. Evaluate routine inspections and assess adequacy and frequency needed for safety, security, and demonstration of compliance with regulatory requirements and license conditions. Evaluate non-routine inspections through identification of each inspection module or segments and evaluation of 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 should review the license, license conditions and amendments, and current LLRW activities. The reviewer should evaluate the need for any additional inspection areas or modules taking into consideration new activities and current life cycle of the facility.
- d. Include a qualitative evaluation that examines the justifications for an Agreement State revision of its internal inspection frequencies.
- e. When reviewing an Agreement State program, use inspection data provided by the State from the 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 NRC IMC

2801 and 2641, or current NRC policy. In addition, the reviewer should ensure that overdue inspections are tallied in a consistent fashion, based on the frequency specified in NRC IMC 2401 and 2602.

3. Technical Quality of LLRW Inspections

The review details presented in OSP Procedure SA-102 (“Technical Quality of Inspection”) should be evaluated. The reviewer should consider the life cycle of the inspected LLRW facility and address 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. State inspection of environmental monitoring activities and review of inspection reports for completeness and adequacy is another indicator of the quality of inspection. The following specific review details may apply to the LLRW program reviews, also:

- a. The risk significance of radiological and chemical hazards at an LLRW facility should be considered during an inspection. The inspector should use proper and calibrated instruments or tools to detect radioactivity and potential radiation exposure. The inspector should have access to chemical safety experts and/or to consultants if a chemical safety issue is noticed on an inspection. In addition to potential radiological hazards, the inspector should understand the regulatory authority and relationships between agencies in regulating waste shipments, potential chemical hazards, and potential environmental releases at LLRW disposal facility, including waste storage and treatment facilities (e.g., OSHA, MSHA, U.S. Environmental Protection Agency (EPA), U.S. Department of Transportation (DOT), and State agencies).
- b. Inspection records for each module, or segment, of the LLRW program should be evaluated for completeness and follow-up actions. Inspection findings, including violations, should be communicated to the licensee in a timely fashion and licensee responses should be evaluated and documented.
- c. Cleanup and decommissioning projects (within the facility), release of equipment, and release of vehicles or cars, after downloading of waste shipments, should be inspected in accordance with written inspection protocols to confirm public and workers’ safety in decommissioning and release of equipment. Inspections should focus on radiological safety aspects, implementation of safety procedures, effluent

releases to the environment, public and worker's exposure, and suitability of decontaminated areas, equipment, and structures for release.

- d. There should be review of workers exposure records and ALARA records, to minimize radiological exposure levels.
- e. There should be review of the quality and adequacy of environmental monitoring data (air, soil, surface-water, and/or groundwater) and evaluation of data analysis for potential radionuclide releases, on-site/off-site, above threshold limits.
- f. There should be review of inspection data regarding the quality and performance of liners and/or covers placed at the LLRW disposal facility, to ensure compliance with the required standards.
- g. There should be review of inspection records for waste shipments, to ensure that radiological and physical/chemical characteristics of waste are consistent with license requirements and NRC's and DOT's regulations and guidance.
- h. Decommissioning recordkeeping [see 10 CFR 40.36(f)] should be periodically checked for completeness, especially before commencement of decommissioning.
- i. There should be sufficient radiological monitoring and surveys, given the potential extent of any onsite/off-site residual contamination, conducted before license termination and site closure. Licensee's survey results should be validated through a closeout inspection or confirmatory survey. See Inspection Procedure 83890 "Closeout Inspection and Survey."

#### 4. Technical Quality of Licensing Actions

The review details presented in the OSP Procedure SA-104 (Technical Quality of Licensing Actions) should be evaluated. The reviewer should determine the current life cycle of the licensed facility (e.g., pre-licensing/construction, pre-operation, operational, a 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. For the closure and post-closure phase licensing actions may involve onsite, buffer zone, and offsite environmental monitoring activities, mitigation and cleanup measures, and financial assurance and institutional control issues. In addition, the following specific review details may apply to the LLRW program reviews, also:

- a. A sample of licensing actions that are representative based on the number and type of actions performed during the review period should be reviewed, 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. Licensing actions supporting technical documents (e.g., safety evaluation reports and/or environmental impact analysis) should be examined.
- 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. 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 should examine how well the decision-making process is documented, including any significant deficiencies related to health and safety. The reviewer should determine if decisions are made under a proper signature by an authorized official.
- f. If the initial review suggests a weakness on the part of the program, 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, flexibility may be used to make 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, customarily requisite for supporting licensing action. If management took appropriate steps to work off the significant backlog, an unsatisfactory rating may not be appropriate.
- h. The existence of criteria for timeliness of licensing actions should be checked and verified if such criteria are routinely followed.
- i. Justifications for the Region or Agreement State to grant an exception or exemption from an applicable rule, regulatory guide, or industry standard, should be checked and verified.

- j. It should be determined whether adequate financial assurance for the decommissioning and site closure has been established in accordance with regulatory requirements and applicable guidance. It should be determined whether financial assurance mechanisms are reviewed and maintained to ensure that they will be executable and provide sufficient funding for decommissioning and closure, if the licensee liquidates or is otherwise unable to pay for remedial actions or decommissioning.
- k. It should be determined during the on-site review if the Agreement State has made a special effort to 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 STP Procedure SA-105 (“Technical Quality of Incidents and Allegations”) should be evaluated. In addition, the following specific review details may apply to the LLRW program reviews, also:

- a. Coordination should be made with NRC’s Region to become aware of LLRW allegations submitted to NRC through the concerned Region.
- b. There should be a review of State response regarding incidents and allegations.
- c. A representative number of incidents and allegations filed at the State should be evaluated from the entire review period. If possible, all incidents and allegations should be reviewed.
- d. When selected incidents and allegations can be reviewed, the review should focus on: (a) risk significant aspects; (b) discernment of root causes; (c) confidentiality and protection of alligator identity; (d) conformance to applicable specific rules, guides, license conditions, or general guidance provided in Section V, SA-105, “Response to Incidents and Allegations,” and (e) follow-up actions for closure of allegations.

- e. The review should include all pertinent event records entered in the Nuclear Materials Events Database (NMED). The reviewer should verify whether event actions and notifications conducted as specified in SA-300, “Reporting Material Events for Agreement State,” and comparable to 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.