



UNITED STATES  
NUCLEAR REGULATORY COMMISSION  
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Dear Sirs:

The U.S. Nuclear Regulatory Commission (NRC) uses the Integrated Materials Performance Evaluation Program (IMPEP) in the evaluation of Agreement State programs. Enclosed for your review is the draft IMPEP report, which documents the results of the Agreement State review held in Columbia on June 19-23, 2017. The review team's preliminary findings were discussed with you and your staff on the last day of the review. The review team's proposed recommendations are that the South Carolina program be found adequate to protect public health and safety, and compatible with the NRC's program.

The NRC conducts periodic reviews of Agreement State programs to ensure that public health and safety are adequately protected from the potential hazards associated with the use of radioactive materials and that Agreement State programs are compatible with the NRC's program. The process, titled IMPEP, employs a team of NRC and Agreement State staff to assess Agreement States' and NRC Regional Offices' radioactive materials programs. All reviews use common criteria in the assessment and place primary emphasis on performance. The final determination of adequacy and compatibility of each Agreement State program, based on the review team's report, is made by a Management Review Board (MRB) composed of NRC managers and an Agreement State program manager who serves as a liaison to the MRB.

In accordance with procedures for implementation of IMPEP, we are providing you with a copy of the draft team report for your review and comment prior to submitting the report to the MRB. Comments are requested within 4 weeks from your receipt of this letter. This schedule will permit the issuance of the final report in a timely manner that will be responsive to your needs.

The team will review the response, make any necessary changes to the report, and issue it to the MRB as a proposed final report. As discussed with South Carolina managers and staff on the last day of the review, the South Carolina MRB meeting has been scheduled for September 14, 2017, at 2:30 p.m. ET. The NRC will provide invitational travel for you or your designee to attend the MRB meeting at the NRC Headquarters in Rockville, Maryland. The NRC has video

A. Gantt, D. Scaturo

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conferencing capability if it is more convenient for the State to participate through this medium. Please contact me if you desire to establish a video conference for the meeting.

If you have any questions regarding the enclosed report, please contact me at 301-415-5804.

Thank you for your cooperation.

Sincerely,

***/RA/***

Paul Michalak, Chief  
Agreement State Programs Branch  
Division of Material Safety, State, Tribal, and  
Rulemaking Programs  
Office of Nuclear Material Safety and Safeguards

Enclosure:  
FY 2017 Draft IMPEP Report

SUBJECT: SOUTH CAROLINA FY2017 DRAFT IMPEP REPORT

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INTEGRATED MATERIALS PERFORMANCE EVALUATION PROGRAM  
REVIEW OF THE SOUTH CAROLINA AGREEMENT STATE PROGRAM

JUNE 19 – 23, 2017

**DRAFT REPORT**

Enclosure

## **EXECUTIVE SUMMARY**

This report presents the results of the Integrated Materials Performance Evaluation Program (IMPEP) review of the South Carolina Agreement State Program. The review was conducted during the period of June 19-23, 2017, by a team composed of technical staff members from the U.S. Nuclear Regulatory Commission (NRC) and the State of Utah.

Based on the results of this review, South Carolina's performance was found satisfactory for all performance indicators reviewed. The team made two recommendations for the South Carolina Program (see Section 5.0).

Accordingly, the team recommends that the South Carolina Agreement State Program be found adequate to protect public health and safety and compatible with NRC's program. The team recommends that the next IMPEP review take place in approximately 5 years and a periodic meeting in 2.5 years because of satisfactory performance in all indicators for consecutive IMPEP reviews.

Enclosure

## 1.0 INTRODUCTION

This report presents the results of the review of the South Carolina Agreement State Program radioactive materials safety and low-level radioactive waste disposal programs. The review was conducted during the period of June 19-23, 2017, by a team composed of technical staff members from the U.S. Nuclear Regulatory Commission (NRC) and the State of Utah. Team members are identified in Appendix A. The review was conducted in accordance with the "Implementation of the Integrated Materials Performance Evaluation Program and Rescission of Final General Statement of Policy," published in the *Federal Register* on October 16, 1997, and NRC Management Directive 5.6 (MD 5.6), "Integrated Materials Performance Evaluation Program (IMPEP)," dated February 26, 2004. Preliminary results of the review, which covered the period of May 26, 2012, to June 23, 2017, were discussed with South Carolina managers on the last day of the review.

In preparation for the review, a questionnaire addressing the common and applicable non-common performance indicators was sent to the South Carolina Bureau of Radiological Health (Bureau) and Division of Land and Waste Management (Division) on February 21, 2017. The Bureau and Division provided their responses to the questionnaire on June 2 and June 5, 2017, respectively. A copy of the consolidated questionnaire response is available in the NRC's Agencywide Documents Access and Management System (ADAMS) using the Accession Number ML17158B203.

The South Carolina Agreement State Program is administered by two agencies within the Department of Health and Environmental Control (Department). The radioactive materials program is administered by the Bureau and the low-level radioactive waste disposal program is administered by the Division. Organization charts are available in ADAMS (Accession Number ML17158B198).

At the time of the review, the Bureau regulated 355 specific licenses authorizing possession and use of radioactive materials, and the Division regulated 10 licenses in addition to the Barnwell low-level radioactive waste disposal site. The review focused on the radioactive materials program as it is carried out under the Section 274b. (of the Atomic Energy Act of 1954, as amended) Agreement between the NRC and the State of South Carolina.

The team evaluated the information gathered against the established criteria for each common and the applicable non-common performance indicators and made a preliminary assessment of the South Carolina Agreement State Program's performance.

## 2.0 PREVIOUS IMPEP REVIEW AND STATUS OF RECOMMENDATIONS

The previous IMPEP review concluded on May 25, 2012. The final report is available in ADAMS (Accession Number ML12235A239). The results of the review and the status of the recommendation(s) are as follows:

Technical Staffing and Training: Satisfactory  
Recommendation: None

Status of Materials Inspection Program: Satisfactory  
Recommendation: None

Technical Quality of Inspections: Satisfactory  
Recommendation: None

Technical Quality of Licensing Actions: Satisfactory  
Recommendation: None

Technical Quality of Incident and Allegation Activities: Satisfactory  
Recommendation: None

Compatibility Requirements: Satisfactory  
Recommendation: None

Sealed Source Device Evaluation Program: Satisfactory  
Recommendation: None

Low-Level Radioactive Waste Program: Satisfactory  
Recommendation: None

Overall finding: Adequate and Compatible

### 3.0 COMMON PERFORMANCE INDICATORS

Five common performance indicators are used to review the NRC regional and Agreement State radioactive materials programs. These indicators are (1) Technical Staffing and Training, (2) Status of Materials Inspection Program, (3) Technical Quality of Inspections, (4) Technical Quality of Licensing Actions, and (5) Technical Quality of Incident and Allegation Activities.

#### 3.1 Technical Staffing and Training

The ability to conduct effective licensing and inspection programs is largely dependent on having a sufficient number of experienced, knowledgeable, well-trained technical personnel. Under certain conditions, staff turnover could have an adverse effect on the implementation of these programs, and thus could affect public health and safety. Apparent trends in staffing must be explored. Review of staffing also requires a consideration and evaluation of the levels of training and qualification. The evaluation standard measures the overall quality of training available to, and taken by, materials program personnel.

##### a. Scope

The team used the guidance in State Agreements procedure SA-103, "Reviewing the Common Performance Indicator: Technical Staffing and Training," and evaluated South Carolina's performance with respect to the following performance indicator objectives:

- A well-conceived and balanced staffing strategy has been implemented throughout the review period.
- Agreement State training and qualification program is equivalent to NRC Inspection Manual Chapter (IMC) 1248, "Formal Qualifications Program for Federal and State Material and Environmental Management Programs."
- Qualification criteria for new technical staff are established and are being followed or that qualification criteria will be established if new staff members are hired.
- Any vacancies, especially senior-level positions, are filled in a timely manner.
- There is a balance in staffing of the licensing and inspection programs.
- Management is committed to training and staff qualification.
- Individuals performing materials licensing and inspection activities are adequately qualified and trained to perform their duties.
- License reviewers and inspectors are trained and qualified in a reasonable period of time.

b. Discussion

The South Carolina Agreement State Program's Bureau of Radiological Health is composed of seven staff members which equals 6.3 full time equivalents (FTE) for the radioactive materials program. The staff positions include one bureau chief, one division director, two section managers and three technical staff. Currently, there are no vacancies. During the review period one staff member left the program and three staff members were hired. Two of the hirings were to address vacant positions that were in place at the time of the previous IMPEP review. The vacant positions extending back to the previous IMPEP review were vacant two years and three years and three months. The vacancy that occurred during this review period was only vacant for a period of three months. The Bureau has a training and qualification manual, however the team determined it is not compatible to NRC's IMC 1248.

c. Evaluation

The team determined that during the review period the South Carolina program met the performance indicator objectives listed in Section 3.1.a, with one exception:

- Agreement State training and qualification program is equivalent to NRC Inspection Manual Chapter (IMC) 1248, "Formal Qualifications Program for Federal and State Material and Environmental Management Programs."

The NRC published IMC 1248 on April 19, 2013. There are nine qualification journals in IMC 1248. Seven of the qualification journals were transferred from IMC 1246, "Formal Qualification Programs in the Nuclear Material Safety and Safeguards Program Area," with no changes. The qualification journals for Materials Health Physics License Reviewers (IMC 1248, Appendix A) and Materials Health Physics Inspector (IMC 1248, Appendix B) were completely revised. The revisions include new courses, training on the Pre-Licensing Guidance, refresher training requirements, and incorporating 10 Code of Federal Regulations (CFR) Part 37, "Physical Protection of Category 1 and Category 2 Quantities of Radioactive Material." In All Agreements States Letter FSME-13-043, the Agreement States were informed of this publication and that the revised qualification journals would be a compatibility category C. The Agreement States were given six months to adopt the essential elements of IMC 1248 and implement them into their



training and qualification programs. In reviewing the Bureau's training and qualification manual, the team determined that it did not contain the essential elements of IMC 1248. The team recommends that the Bureau update its training and qualification manual to incorporate the essential elements of IMC 1248 and implement it for all staff to ensure continued effective and consistent training and development of its staff.

Based on the interviews with the staff and the results from the inspection, licensing, and incident response sections of this report, the team determined that current staff were well trained and qualified to perform their duties. No performance issues were identified because of not having a documented training and qualification program that is equivalent to IMC 1248.

d. Results

Based on the IMPEP evaluation criteria in MD 5.6, the team recommends that South Carolina's performance with respect to the indicator, Technical Staffing and Training, be found satisfactory.

3.2 Status of the Materials Inspection Program

Periodic inspections of licensed operations are essential to ensure that activities are being conducted in compliance with regulatory requirements and consistent with good safety practices. The frequency of inspections is specified in NRC IMC, Chapter 2800, "Materials Inspection Program," and is dependent on the amount and kind of material, the type of operation licensed, and the results of previous inspections. There must be a capability for maintaining and retrieving statistical data on the status of the inspection program.

a. Scope

The team used the guidance in State Agreements procedure SA-101, "Reviewing the Common Performance Indicator: Status of the Materials Inspection Program," and evaluated South Carolina's performance with respect to the following performance indicator objectives:

- Initial inspections and inspections of Priority 1, 2, and 3 licensees are performed at the frequency prescribed in IMC 2800.
- Candidate licensees working under reciprocity are inspected in accordance with the criteria prescribed in IMC 1220, "Processing of NRC Form 241, Report of Proposed Activities in Non-Agreement States, Areas of Exclusive Federal Jurisdiction, and Offshore Waters, and Inspection of Agreement State Licensees Operating under 10 CFR 150.20."
- Deviations from inspection schedules are normally coordinated between technical staff and management.
- There is a plan to perform any overdue inspections and reschedule any missed or deferred inspections; or a basis has been established for not performing any overdue inspections or rescheduling any missed or deferred inspections.
- Inspection findings are communicated to licensees in a timely manner (30 calendar days, or 45 days for a team inspection, as specified in IMC 0610, "Nuclear Material Safety and Safeguards Inspection Reports").

b. Discussion

South Carolina's inspection frequency is the same for similar license types in IMC 2800. The Bureau performed 238 inspections during the review period. The Bureau conducted 4.6 percent of Priority 1, 2, 3, and initial inspections overdue. Specifically, South Carolina performed eight higher priority (Priority 1, 2, and 3) inspections overdue, and three initial inspections overdue.

A sampling of 35 inspection reports indicated that no inspection findings were communicated to the licensees beyond the Bureau's goal of 30 days after the inspection exit.

The Bureau grants reciprocity to out-of-state licensees based on South Carolina's fiscal year (FY), which runs July 1-June 30. The Bureau also tracks the inspection of reciprocity candidates on a fiscal year basis. For each fiscal year during the review period, the Bureau performed greater than 20 percent of candidate reciprocity inspections, except for FY2013-2014 and FY2014-2015. The Bureau performed 30.8 percent of reciprocity inspections FY2012-2013, 12.5 percent in FY2013-2014, 18.9 percent in FY2014-2015, 27.3 percent in FY2015-2016, and 30.8 percent in FY2016-2017. Overall, the Bureau performed 24.0 percent of candidate reciprocity inspections during the entire review period.

c. Evaluation

The team determined that during the review period South Carolina met the performance indicator objectives listed in Section 3.2.a.

d. Results

Based on the IMPEP evaluation criteria in MD 5.6, the team recommends that South Carolina's performance with respect to the indicator, Status of the Materials Inspection Program, be found satisfactory.

3.3 Technical Quality of Inspections

Inspections, both routine and reactive, provide assurance that licensee activities are carried out in a safe and secure manner. Accompaniments of inspectors performing inspections, and the critical evaluation of inspection records are used to assess the technical quality of an Agreement State's inspection program.

a. Scope

The team used the guidance in State Agreements procedure SA-102, "Reviewing the Common Performance Indicator: Technical Quality of Inspections," and evaluated South Carolina's performance with respect to the following performance indicator objectives:

- Inspections of licensed activities focus on health, safety, and security.
- Inspection findings are well-founded and properly documented in reports.
- Management promptly reviews inspection results.

- Procedures are in place and used to help identify root causes and poor licensee performance.
- Inspections address previously identified open items and violations.
- Inspection findings lead to appropriate and prompt regulatory action.
- Supervisors, or senior staff as appropriate, conduct annual accompaniments of each inspector to assess performance and assure consistent application of inspection policies.
- For programs with separate licensing and inspection staffs, procedures are established and followed to provide feedback information to license reviewers.
- For Agreement States, inspection guides are consistent with NRC guidance.
- An adequate supply of calibrated survey instruments is available to support the inspection program.

b. Discussion

The team evaluated the inspection reports and enforcement documentation, and interviewed inspectors for 35 materials inspections conducted during the review period. The casework reviewed included inspections conducted by six current and former Bureau inspectors and covered medical, industrial, commercial, academic, research, and service licenses.

Team members accompanied five program inspectors on April 10-14, 2017. No performance problems were noted during the inspector accompaniments. The inspectors were well-trained, prepared, and performed thorough inspections of the licensees' radiation safety programs. The team determined that the inspections were adequate to assess radiological health, safety, and security at each of the licensed facilities. The inspector accompaniments are identified in Appendix B.

The team noted that supervisory accompaniments were performed on an annual basis for each inspector throughout the review period. The accompaniment reports contained sufficient details to document the areas covered during the accompaniments.

c. Evaluation

The team determined that during the review period South Carolina met the performance indicator objectives listed in Section 3.3.a.

d. Results

Based on the IMPEP evaluation criteria in MD 5.6, the team recommends that South Carolina's performance with respect to the indicator, Technical Quality of Inspections, be found satisfactory.

3.4 Technical Quality of Licensing Actions

The quality, thoroughness, and timeliness of licensing actions can have a direct bearing on public health and safety, and security. An assessment of licensing procedures, actual implementation of these procedures, and documentation of communications and associated actions between the South Carolina licensing staff and regulated community will be a significant indicator of the overall quality of the program.

a. Scope

The team used the guidance in State Agreements procedure SA-104, "Reviewing the Common Performance Indicator: Technical Quality of Licensing Actions," and evaluated South Carolina's performance with respect to the following performance indicator objectives:

- Licensing action reviews are thorough, complete, consistent, and of acceptable technical quality with health, safety, and security issues properly addressed.
- Essential elements of license applications have been submitted and elements are consistent with current regulatory guidance (e.g., financial assurance, increased controls, pre-licensing guidance).
- License reviewers, if applicable, have the proper signature authority for the cases they review independently.
- License conditions are clearly stated and can be inspected.
- Deficiency letters clearly state regulatory positions and are used at the proper time.
- Reviews of renewal applications demonstrate a thorough analysis of a licensee's inspection and enforcement history.
- Applicable guidance documents are available to reviewers and are followed (e.g., NUREG-1556 series, pre-licensing guidance, regulatory guides, etc.).
- Licensing practices for risk significant radioactive materials are appropriately implemented including increased controls and fingerprinting orders (Part 37 equivalent).
- Documents containing sensitive security information are properly marked, handled, controlled, and secured.

b. Discussion

During the review period, the State of South Carolina performed over 1,000 radioactive materials licensing actions. The team evaluated 20 radioactive materials licensing actions, which included 5 new applications, 7 amendments, 5 renewals, and 3 terminations. The team evaluated casework which included the following license types: broad scope, medical diagnostic and therapy, industrial radiography, research and development, academic, nuclear pharmacy, gauges, and financial assurance. The casework sample represented work from five current license reviewers.

c. Evaluation

The team determined that during the review period South Carolina met the performance indicator objectives listed in Section 3.4.a.

d. Results

Based on the IMPEP evaluation criteria in MD 5.6, the team recommends that South Carolina's performance with respect to the indicator, Technical Quality of Licensing Actions, be found satisfactory.

### 3.5 Technical Quality of Incident and Allegation Activities

The quality, thoroughness, and timeliness of response to incidents and allegations of safety concerns can have a direct bearing on public health and safety. An assessment of incident response and allegation investigation procedures, actual implementation of these procedures, internal and external coordination, and investigative and follow-up actions are a significant indicator of the overall quality of the incident response and allegation program.

#### a. Scope

The team used the guidance in State Agreements procedure SA-105, "Reviewing the Common Performance Indicator: Technical Quality of Incident and Allegation Activities," and evaluated South Carolina's performance with respect to the following performance indicator objectives:

- Incident response, investigation, and allegation procedures are in place and followed.
- Response actions are appropriate, well-coordinated, and timely.
- On-site responses are performed when incidents have potential health, safety, or security significance.
- Appropriate follow-up actions are taken to ensure prompt compliance by licensees.
- Follow-up inspections are scheduled and completed, as necessary.
- Notifications are made to the NRC Headquarters Operations Center for incidents requiring a 24-hour or immediate notification to the Agreement State or NRC.
- Incidents are reported to the Nuclear Material Events Database (NMED).
- Allegations are investigated in a prompt, appropriate manner.
- Concerned individuals are notified of investigation conclusions.
- Concerned individuals' identities are protected, as allowed by law.

#### b. Discussion

During the review period, 30 radioactive materials incidents were reported to the Bureau, of which 21 were reportable to NRC. The team evaluated 17 radioactive materials incidents, which included 4 lost/stolen radioactive materials, 1 potential overexposures, 1 medical event, 8 damaged or failed equipment, 1 leaking source, and 2 contamination events. South Carolina dispatched inspectors to perform onsite follow-up for 6 of the 17 cases reviewed.

During the review period, two allegations were received by South Carolina. Both allegations were referred to South Carolina by the NRC.

#### c. Evaluation

The team determined that during the review period South Carolina met the performance indicator objectives listed in Section 3.5.a.

The team identified that South Carolina's incident response procedures had not been updated in several years. For example, they referred to the NRC Office of Analysis and Evaluation of Operational Data, and the Office of State Programs. Both offices have

been merged into other offices at NRC for well over a decade. The incident response procedures indicated that these offices would periodically provide status reports to South Carolina and request information from the State, which is no longer the case. Information requests regarding incidents usually come from the NRC's NMED contractors or from the Regional State Agreements Officer.

The team noted that the Bureau performed site inspections for 6 out of the 17 incidents reviewed. The Bureau's response and documentation for the site investigations were outstanding. The incident records provided a clear explanation of the incident, the licensee's response to mitigate the hazards from the incident, and the State's response and follow-up to the incident, as well as, any additional corrective actions taken by the licensee. For the 11 incidents that the Bureau reviewed by phone, email, or letter correspondence, the team noted that it was difficult to determine the Bureau's response from the incident records and documentation. There was also information missing about whether the licensee's long term corrective actions were reviewed or followed-up on at the next inspection or at the next available opportunity. After discussing each of the incidents with the Bureau's managers and staff, the team determined that additional follow-up actions were taken by the Bureau, or there was an acceptable basis for no additional actions being warranted, however that information was not included in the files.

The team also discussed the latest NRC guidance for incident response. For example, MD 8.2, "NRC Incident Response Program," MD 8.3, "NRC Incident Investigation Program," MD 8.10, "NRC Assessment Program for a Medical Event or an Incident Occurring at a Medical Facility," have all been revised during the current IMPEP review period. In addition to the Management Directives, IMC 1301, "Response to Radioactive Material Incidents That Do Not Require Activation of the NRC Incident Response Plan," also provides guidance about if and when a site response should be considered and how timely a response that response should be. While the State's procedures have been adequate for implementing their response program for several years as indicated by previous IMPEP teams, the team discussed the need for reviewing the latest guidance and updating the procedures.

Thus, the team determined that, although the Bureau appropriately responded to incidents, up-to-date guidance is necessary to help ensure continued performance. The team recommends that the Bureau update its incident response procedures by incorporating the latest event response guidance to help ensure that responses to incidents are suitable, timely, and effectively documented.

#### d. Results

Based on the IMPEP evaluation criteria in MD 5.6, the team recommends that South Carolina's performance with respect to the indicator, Technical Quality of Incident and Allegation Activities, be found satisfactory.

#### 4.0 NON-COMMON PERFORMANCE INDICATORS

Four non-common performance indicators are used to review Agreement State programs: (1) Compatibility Requirements, (2) Sealed Source and Device (SS&D) Evaluation Program, (3) Low-Level Radioactive Waste Disposal (LLRW) Program, and

(4) Uranium Recovery Program. The NRC's Agreement with South Carolina does not relinquish regulatory authority for a uranium recovery program; therefore, only the first three non-common performance indicators applied to this review.

#### 4.1 Compatibility Requirements

State statutes should authorize the State to establish a program for the regulation of agreement material and provide authority for the assumption of regulatory responsibility under the agreement. The statutes must authorize the State to promulgate regulatory requirements necessary to provide reasonable assurance of protection of public health, safety, and security. The State must be authorized through its legal authority to license, inspect, and enforce legally binding requirements, such as regulations and licenses. NRC regulations that should be adopted by an Agreement State for purposes of compatibility or health and safety should be adopted in a time frame so that the effective date of the State requirement is not later than 3 years after the effective date of NRC's final rule. Other program elements, as defined in Appendix A of State Agreements procedure SA-200, "Compatibility Categories and Health and Safety Identification for NRC Regulations and Other Program Elements," that have been designated as necessary for maintenance of an adequate and compatible program should be adopted and implemented by an Agreement State within 6 months following NRC designation.

##### a. Scope

The team used the guidance in State Agreements procedure SA-107, "Reviewing the Non-Common Performance Indicator: Compatibility Requirements," and evaluated South Carolina's performance with respect to the following performance indicator objectives. A complete list of regulation amendments can be found on the NRC website at the following address: <https://scp.nrc.gov/regtoolbox.html>.

- The Agreement State program does not create conflicts, duplications, gaps, or other conditions that jeopardize an orderly pattern in the regulation of radioactive materials under the Atomic Energy Act, as amended.
- Regulations adopted by the Agreement State for purposes of compatibility or health and safety were adopted no later than 3 years after the effective date of the NRC regulation.
- Other program elements, as defined in SA-200 that have been designated as necessary for maintenance of an adequate and compatible program have been adopted and implemented within 6 months of NRC designation.
- The State statutes authorize the State to establish a program for the regulation of agreement material and provide authority for the assumption of regulatory responsibility under the agreement.
- The State is authorized through its legal authority to license, inspect, and enforce legally binding requirements such as regulations and licenses.
- Impact of sunset requirements, if any, on the State's regulations.

##### b. Discussion

South Carolina became an Agreement State on September 15, 1969. The South Carolina Agreement State Program's current effective statutory authority is contained in the Code of Laws of South Carolina, the Atomic Energy and Radiation Control Act, the

Radioactive Waste and Transportation Act, and Environmental Protection Fees. The Department is designated in Section 13-7-40 of South Carolina's Atomic Energy and Radiation Control Act, as the State's radiation control agency. Section 13-7-40 also allows for a Technical Advisory Radiation Control Council (TARCC). TARCC advises the Department on matters pertaining to ionizing and nonionizing radiation and standards and regulations to be adopted, modified, promulgated, or repealed by the Department. No legislation affecting the radiation control program was passed during the review period.

The State's administrative rulemaking process takes approximately 12 months from drafting to finalizing a rule. The public, NRC, other agencies, TARCC, and potentially impacted licensees and registrants are offered an opportunity to comment during the process. Comments are considered and incorporated, as appropriate, before the regulations are finalized and approved. The team noted that the State's rules and regulations are not subject to "sunset" laws.

During the review period, South Carolina submitted ten final regulation amendments, eleven proposed regulation amendments and no legally binding license conditions to the NRC for a compatibility review. None of the amendments were overdue for State adoption at the time of submission. At the time of this review no amendments were overdue for adoption.

c. Evaluation

The team determined that during the review period South Carolina met the performance indicator objectives listed in Section 4.1.a.

d. Results

Based on the IMPEP evaluation criteria in MD 5.6, the team recommends that South Carolina's performance with respect to the indicator, Compatibility Requirements, be found satisfactory.

4.2 Sealed Source and Device Evaluation Program

Adequate technical evaluations of SS&D designs are essential to ensure that SS&Ds will maintain their integrity and that the design is adequate to protect public health and safety. NUREG-1556, Volume 3, "Consolidated Guidance about Materials Licenses: Applications for Sealed Source and Device Evaluation and Registration," provides information on conducting SS&D reviews and establishes useful guidance. Three sub elements, technical staffing and training, technical quality of the product evaluation program, and evaluation of defects and incidents regarding SS&D's, will be evaluated to determine if the SS&D program is satisfactory. Agreement States with authority for SS&D evaluation programs who are not performing SS&D reviews are required to commit in writing to having an SS&D evaluation program in place before performing evaluations.

a. Scope

The team used the guidance in State Agreements procedure SA-108, "Reviewing the



Non-Common Performance Indicator: Sealed Source and Device Evaluation Program,” and evaluated South Carolina’s performance with respect to the following performance indicator objectives:

#### Technical Staffing and Training

- A well-conceived and balanced staffing strategy has been implemented throughout the review period.
- Qualification criteria for new technical staff are established and are being followed or that qualification criteria will be established if new staff members are hired.
- Any vacancies are filled in a timely manner.
- Management is committed to training and staff qualification.
- Individuals performing SS&D evaluation activities are adequately qualified and trained to perform their duties.
- SS&D reviewers are trained and qualified in a reasonable period of time.

#### Technical Quality of the Product Evaluation Program

- SS&D evaluations are adequate, accurate, complete, clear, specific, and consistent with NUREG-1556, Volume 3.

#### Evaluation of Defects and Incidents

- SS&D incidents are reviewed to detect possible manufacturing defects and the root causes of these incidents.
- Incidents are evaluated to determine if other products may be affected by similar problems. Appropriate action and notifications to NRC, Agreement States, and others, as appropriate, should occur in a timely manner.

### b. Discussion

#### Technical Staffing and Training

South Carolina has two staff qualified to perform SS&D reviews, and one staff member working towards full SS&D qualification. Currently, there are no vacancies. South Carolina has a training program equivalent to NRC training requirements listed in IMC 1248, Appendix D.

#### Technical Quality of the Product Evaluation

South Carolina has one SS&D licensee with three active registration certificates. The team evaluated one SS&D amendment action processed during the review period.

#### Evaluation of Defects and Incidents Regarding SS&Ds

No incidents involving SS&D registered products occurred during the review period.

c. Evaluation

The team determined that during the review period South Carolina met the performance indicator objectives listed in Section 4.2.a.

d. Results

Based on the IMPEP evaluation criteria in MD 5.6, the team recommends that South Carolina's performance with respect to the indicator, Sealed Source and Device Evaluation Program, be found satisfactory.

4.3 Low-Level Radioactive Waste Disposal Program

The objective is to determine if South Carolina LLRW disposal program is adequate to protect public health and safety. 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.

a. Scope

The team used the guidance in State Agreements procedure SA-109, "Reviewing the Non-Common Performance Indicator: Low Level Radioactive Waste Disposal Program," and evaluated the South Carolina's performance with respect to the following performance indicator objectives:

Technical Staffing and Training

- Qualified and trained technical staff is available to license, regulate, control, inspect, and assess the operation and performance of the LLRW disposal facility.
- Qualification criteria for new LLRW technical staff are established and are being followed or that qualification criteria will be established if new staff members are hired.
- Any vacancies, especially senior-level positions, are filled in a timely manner.
- There is a balance in staffing the LLRW licensing and inspection programs.
- Management is committed to training and staff qualification.
- Individuals performing LLRW licensing and inspection activities are adequately qualified and trained to perform their duties.
- LLRW license reviewers and inspectors are trained and qualified in a reasonable period of time.

Status of Low-level Radioactive Waste Disposal Inspection Program

- The LLRW facility is inspected at prescribed frequencies.
- Statistical data on the status of the inspection program is maintained and can be retrieved.
- Deviations from inspection schedules are coordinated between LLRW technical staff and management.
- There is a plan to reschedule any missed or deferred inspections or a basis has been established for not rescheduling any missed inspections.

- Inspection findings are communicated to licensees in a timely manner.

#### Technical Quality of Inspections

- Inspections of LLRW licensed activities focus on health, safety, and security.
- Inspection findings are well-founded and properly documented in reports.
- Management promptly reviews inspection results.
- Procedures are in place and used to help identify root causes and poor licensee performance.
- Inspections address previously identified open items and violations.
- Inspection findings lead to appropriate and prompt regulatory action.
- Supervisors conduct annual accompaniments of each LLRW inspector to assess performance and assure consistent application of inspection policies.
- For Agreement States, inspection guides are consistent with NRC guidance.
- An adequate supply of calibrated survey instruments is available to support the inspection program.

#### Technical Quality of Licensing Actions

- Licensing action reviews are thorough, complete, consistent, and of acceptable technical quality with health, safety, and security issues properly addressed.
- Applicable LLRW guidance documents are available to reviewers and are followed (e.g., pre-licensing guidance, regulatory guides, etc.).
- Essential elements of license applications have been submitted and that these elements meet current NRC or Agreement State regulatory guidance for describing the isotopes and quantities used, qualifications of authorized users, facilities, equipment, locations of use, operating and emergency procedures and any other requirements necessary to ensure an adequate basis for the licensing action, e.g., financial assurance, increased controls/Part 37, etc.
- LLRW license reviewers, if applicable, have the proper signature authority for the cases they review independently.
- License tie-down conditions are stated clearly and are inspectable.
- Deficiency letters clearly state regulatory positions and are used at the proper time.
- Reviews of renewal applications demonstrate a thorough analysis of a licensee's inspection and enforcement history.
- Licensing practices for risk significant radioactive materials are appropriately implemented including increased controls and fingerprinting orders (Part 37 equivalent).
- Documents containing sensitive security information are properly marked, handled, controlled, and secured.

#### Technical Quality of Incident and Allegation Activities

- LLRW Incident response, investigation, and allegation procedures are in place and followed.
- Response actions are appropriate, well-coordinated, and timely.
- On-site responses are performed when incidents have potential health, safety, or security significance.
- Appropriate follow-up actions are taken to ensure prompt compliance by licensees.

- Follow-up inspections are scheduled and completed, as necessary.
- Notifications are made to the NRC Headquarters Operations Center for incidents requiring a 24-hour or immediate notification to the Agreement State or NRC.
- Incidents are reported to the NMED.
- Allegations are investigated in a prompt, appropriate manner.
- Concerned individuals are notified of investigation conclusions.
- Concerned individuals' identities are protected, as allowed by law.

b. Discussion

Technical Staffing and Training

The Division has six staff members, including the Division Director, to implement the LLRW Disposal Program responsibilities (4.75 FTE). Within the Division, the licensing and inspection program is implemented by the Infectious and Radioactive Waste Management (IRWM) Section, which consists of a Section Manager, three Health Physicists, and an Environmental Engineer. One of the three Health Physicists is assigned to the Barnwell LLRW disposal facility as the resident inspector. During the review period, three staff members (3.0 FTE) left the LLRW program and two staff members (1.8 FTE) were hired. One position was eliminated. In 2013, one staff member was hired to be primarily in the Infectious Waste group; however, during the 4-year period he was trained in health physics to replace the health physicist who retired on June 1, 2017. Therefore, the LLRW Disposal Program is currently fully staffed. The Division expects two additional staff members will retire during the next review period. The Section Manager explained that the Division can bring new staff on board for training before additional staff leave.

The team examined staff training documentation and conducted interviews with selected staff to assess the qualification and training program. The Division has a training program equivalent to NRC training requirements in IMC 1248, Appendix E, "Training Requirements and Qualification Journal for Division of Waste Management Inspector and License Reviewer."

Status of LLRW Disposal Inspection Program

The Division performs inspections in accordance with the "Radioactive Materials Licensing and Compliance Administrative Procedures Manual," Revision 5. The team examined 10 inspection files and conducted interviews with staff and determined that the Barnwell LLRW disposal facility licensee is inspected at least annually in accordance with the frequency described in IMC 2401.

During the review period, a group of Division inspectors performed 10 semi-annual inspections at the Barnwell LLRW disposal facility. The Division staff also perform weekly site inspections and the resident inspector is at the site daily to conduct routine vehicle and shipment inspections as opportunities arise. The resident inspector also observes disposal operations and collection of split groundwater samples. The team examined 62 of the weekly site inspections. The team determined that the Division performed complete and thorough inspections of the Barnwell LLRW disposal facility during each of the semi-annual inspections. There were no deviations from the prescribed inspection schedule during this review period.

The Division regulates 10 additional LLRW licenses other than the Barnwell LLRW disposal site. The team reviewed all of the inspection reports during the review period for each licensee (32 total).

The team found that inspection reports were complete, findings were well-founded, appropriately documented, and reviewed by the Section Manager prior to sending close-out letters to the licensee or pursuing enforcement actions. The team determined that the inspection reports were communicated to the licensees within 30 calendar days.

#### Technical Quality of LLRW Inspections

The team assessed the quality of LLRW Disposal Program inspections by evaluating inspector performance during accompaniments, reviewing inspection field notes and completed reports, inspection procedures, follow-up on previous inspection findings, as well as regulatory actions taken, and annual supervisory accompaniments.

The team accompanied five Division inspectors during the week of May 15-17, 2017. Three of the inspectors were accompanied during a semi-annual team inspection of the Barnwell LLRW disposal facility, one of the inspectors was accompanied during the weekly site visit at the Barnwell LLRW disposal facility, and the resident inspector was observed conducting a vehicle and shipment inspection of an incoming LLRW disposal shipment. In addition, the IRWM Section manager was observed performing a supervisory accompaniment. The team determined that the inspectors were experienced, prepared, and knowledgeable of the facility, the inspection requirements, and the regulations. The inspections were adequate to assess the safety and radiological hazards at the LLRW disposal facility. The team verified that the Division performs supervisory accompaniments of all inspectors on an annual basis.

#### Technical Quality of LLRW Licensing Actions

The Division last renewed the Barnwell LLRW disposal facility license in 2004, and as of this review continues to await the pending decision of the Administrative Law Court as described above. During this review period, the Division approved nine amendments to the Barnwell LLRW disposal facility license. The team reviewed five of the license amendments completed during this review period. For the 10 licenses other than the Barnwell Disposal site, the team reviewed nine license amendments including five renewals. There were four license terminations performed during the review period. The team reviewed each of the four license terminations.

The team found the casework to be thorough, complete, consistent, and of acceptable technical quality. The license conditions are clear and auditable. Health and safety issues were properly addressed. Tie-down conditions are stated clearly, backed by information contained in the file, and enforceable. Public hearings are held when needed and the Division engages in public outreach, particularly regarding the potential groundwater contamination at the Barnwell site. The team determined that the licensing process was thorough, consistent and of acceptable quality.

### Technical Quality of Incident and Allegation Activities

The team evaluated all five incidents reported to the LLRW program during the review period. All five incidents were reported to NMED. No allegations involving the LLRW program were reported to the Division during the review period. The Division has written procedures for the handling, review, analysis, response, and follow-up of incidents and allegations. The incidents were documented, investigated, reviewed, and closed out in a timely manner.

#### c. Evaluation

The team determined that during the review period South Carolina met the performance indicator objectives listed in Section 4.3.a.

#### d. Results

Based on the IMPEP evaluation criteria in MD 5.6, the team recommends that South Carolina's performance with respect to the indicator, Low-Level Radioactive Waste Disposal Program, be found satisfactory.

## 5.0 SUMMARY

As noted in Sections 3.0 and 4.0 above, South Carolina's performance was found satisfactory for all performance indicators reviewed. The team made two recommendations for the Program.

Accordingly, the team recommends that the South Carolina Agreement State Program be found adequate to protect public health and safety and compatible with the NRC's program. Based on the results of the current IMPEP review, and consecutive IMPEP reviews with satisfactory performance in all indicators, the team recommends that the next full IMPEP review take place in five years, and the periodic meeting take place in two and a half years.

Below are the team's recommendations, as mentioned in the report, for evaluation and implementation by South Carolina:

1. The team recommends that the Bureau update its training and qualification manual to incorporate the essential elements of IMC 1248 and implement it for all staff to ensure continued effective and consistent training and development of its staff (Section 3.1).
2. The team recommends that the Bureau update its incident response procedures by incorporating the latest event response guidance to help ensure that responses to incidents are suitable, timely, and effectively documented (Section 3.5).

## LIST OF APPENDICES

Appendix A	IMPEP Review Team Members
Appendix B	Inspection Accompaniments

## APPENDIX A

### IMPEP REVIEW TEAM MEMBERS

<b>Name</b>	<b>Area of Responsibility</b>
Binesh Tharakan, Region IV	Team Leader Technical Quality of Incident and Allegation Activities
Monica Ford, Region I	Technical Staffing and Training Compatibility Requirements
Dennis O'Dowd, Region III	Status of the Materials Inspection Program Technical Quality of Inspections Inspector Accompaniments
Michelle Simmons, Region IV	Technical Quality of Licensing Actions
Maria Arribas-Colon, NMSS	Sealed Source Device Evaluation Program
Phil Goble, State of Utah	Low-Level Radioactive Waste Disposal Program Inspector Accompaniments



## APPENDIX B

### INSPECTION ACCOMPANIMENTS

The following inspection accompaniments were performed prior to the on-site IMPEP review:

#### SOUTH CAROLINA BUREAU OF RADIOLOGICAL HEALTH

Accompaniment No.: 1	License No.: 963
License Type: Medical - WD Not Required	Priority: 5 (Initial Inspection)
Inspection Date: 04/10/17	Inspector: AG

Accompaniment No.: 2	License No.: 267
License Type: Panoramic Irradiator	Priority: 2
Inspection Date: 04/11/17	Inspector: LC

Accompaniment No.: 3	License No.: 197
License Type: Industrial Radiography	Priority: 1
Inspection Date: 04/12/17	Inspector: AR

Accompaniment No.: 4	License No.: 010
License Type: Medical - HDR	Priority: 2
Inspection Date: 04/13/17	Inspector: MW

Accompaniment No.: 5	License No.: 341
License Type: Industrial (Fixed) Gauges	Priority: 5
Inspection Date: 04/14/17	Inspector: KF

#### SOUTH CAROLINA DIVISION OF WASTE MANAGEMENT

Accompaniment No.: 1	License No.: 097
License Type: Low-Level Radioactive Waste Site	Priority: 1
Inspection Date: 05/15/17-05/18/17	Inspectors: MY, MP, LG, CI, KS